



An Empirical Investigation on Lecturers' in-Service Training and the Academic Performance of Environmental Education Students in South-South, Nigeria

Comfort Nkongho AGBOR ^{1*}, Chinyere Prince Chinedu MMOM ², Nwachukwu Prince OLOLUBE ³

¹ Department of Environmental Education, University of Calabar, Nigeria

² Department of Educational Management, Faculty of Education, Rivers State University, Nigeria

³ Department of Educational Management, Faculty of Education, Ignatius Ajuru University of Education, Nigeria

* Corresponding Author: **Comfort Nkongho AGBOR**

Article Info

ISSN (online): 2583-8261

Volume: 04

Issue: 04

July - August 2025

Received: 23-06-2025

Accepted: 20-07-2025

Published: 18-08-2025

Page No: 167-180

Abstract

The study investigated the relationship between lecturers' in-service training and the academic performance of environmental education students in South-South, Nigeria. The research adopted a correlational survey design. The population of the study comprised all lecturers in the Department of Environmental Education across public universities in the South-South geopolitical zone of Nigeria. A sample size of 549 lecturers was selected using a stratified sampling approach. The stratified random sampling techniques were employed to select lecturers based on their departments and years of teaching experience. The instrument used for data collection was a self-designed questionnaire titled "Lecturers' In-service Training and Students' Academic Performance Questionnaire" (LIT-SAPQ), constructed on a modified four (4) points Likert scale ranging from Very Low Extent VLE (1) to Very High Extent VHE (4). The face and content validity of the instrument were ensured by three experts, one in measurement and evaluation and two in educational administration. The reliability of the instrument was determined through Cronbach's Alpha, which yielded an internal consistency coefficient of .874 to confirm its reliability. Out of the 549 administered questionnaires, 532 valid copies were retrieved which is deemed valid for analysis. Descriptive statistics of mean and standard deviation were used to answer the research questions, while Pearson Product Moment Correlation (PPMC) was employed to test the hypotheses at a 0.05 significance level using SPSS version 29. The findings of the study indicated a significant relationship between various forms of in-service training and the academic performance of students, which demonstrated that consistent professional development enhances lecturers' instructional effectiveness. It was concluded that in-service training significantly contributed to improved lecturers' pedagogical skills, curriculum delivery, and the academic success of environmental education students. The study recommended that higher institutions should invest more in continuous professional development programs tailored to the unique needs of lecturers in environmental education.

DOI : <https://doi.org/10.54660/IJSSER.2025.4.4.167-180>

Keywords: In-service Training, Academic Performance, Students, Environmental Education, Professional Development, Public Universities, South-South Nigeria

Introduction

The professional development of lecturers plays significant role in enhancing the quality of education in Nigerian universities and colleges. For environmental education, this is particularly critical, as the field is characterized by its interdisciplinary nature, and requires lecturers to be proficient not only in traditional pedagogical skills but also in the integration of environmental issues into academic curricula.

In South-South Nigeria, where environmental degradation and sustainability are pressing challenges, lecturers must be equipped with up-to-date knowledge and teaching techniques to promote an academic environment capable of producing highly skilled and environmentally conscious graduates. According to Amadi and Eze (2019) ^[5], lecturers' ability to effectively engage students in critical environmental issues hinges on continuous exposure to emerging trends and advancements in environmental education, which can only be achieved through structured in-service training.

However, despite the recognized importance of lecturers' professional development, many tertiary institutions in South-South Nigeria still struggle to implement comprehensive and effective in-service training programs. Obomanu (2023) ^[17], identified that a significant barrier to effective lecturer development is the lack of consistent and quality-focused professional development opportunities. This challenge is compounded by systemic issues such as inadequate funding, poorly planned workshops, and a lack of commitment from institutional management. Moreover, these training opportunities are often sporadic and uncoordinated, limiting the scope of their impact. For example, while some institutions occasionally offer workshops or seminars, they often fail to address the specific needs of environmental education lecturers, who require specialized training to incorporate global environmental concerns into local contexts. This neglect of subject-specific professional development has had direct consequences on the academic performance of students, as lecturers remain ill-prepared to offer the necessary guidance, expertise, and inspiration that students require to excel.

In-service training programs such as workshops and seminars, sabbaticals, and academic exchange programs have been acknowledged as critical mechanisms for professional growth. These opportunities provide lecturers with exposure to new teaching methodologies, subject matter expertise, and international perspectives, all of which are essential for the improvement of teaching effectiveness. However, Nwine and Egbezor (2022) ^[15], argued that the implementation of such programs is often inconsistent and inadequate in South-South Nigeria. While some universities have introduced policies that encourage sabbaticals and exchange programs, their accessibility remains limited, especially for junior lecturers or those in departments with fewer resources. Furthermore, the lack of a structured follow-up mechanism to assess the impact of these programs on both lecturers and students leaves much to be desired. This highlights the need for a more systematic approach to in-service training in the region, one that integrates both international and local knowledge to ensure that lecturers are well-equipped to address the environmental challenges faced by their students.

The rise in Massive Open Online Courses (MOOCs) has introduced an innovative avenue for professional development that transcends geographical boundaries. MOOCs offer lecturers in South-South Nigeria the opportunity to access high-quality, specialized courses from leading academic institutions worldwide. According to Iyalla and Opuwari (2021) ^[12], MOOCs have gained traction as a viable alternative to traditional in-person training programs, particularly in regions where logistical challenges

hinder the organization of physical workshops. However, the effectiveness of MOOCs in enhancing lecturers' teaching capabilities remains a subject of debate. While they offer flexibility and accessibility, the lack of face-to-face interaction and personalized guidance have limited their impact on lecturers' pedagogical skills. Furthermore, the digital divide in many South-South universities characterized by limited internet access and technological infrastructure poses a significant challenge to the widespread adoption of MOOCs for professional development. As such, while MOOCs represent a promising avenue for growth, their integration into the training framework for environmental education lecturers must be accompanied by measures to overcome these infrastructural barriers (Agbor *et al.*, 2025) ^[1].

Train-the-trainer programs have also emerged as a key strategy for improving the quality of instruction in higher education. These programs are designed to equip selected lecturers with the skills and knowledge necessary to train their peers, thereby creating a ripple effect throughout academic departments. According to Odum and Kalagbor (2020) ^[19], train-the-trainer programs can significantly enhance the teaching capacity of lecturers by enabling them to adopt more innovative and effective pedagogical approaches. However, in South-South Nigeria, the lack of proper coordination and the insufficient number of experienced trainers has hampered the success of these initiatives. While some universities have initiated train-the-trainer programs, their impact has been limited due to logistical challenges and a lack of sustainable structures for continuous development.

The academic performance of environmental education students is inextricably linked to the quality of teaching they receive, which in turn, is influenced by the extent and quality of lecturers' in-service training. Omoregie and Ogundele (2020) ^[24], highlighted a strong correlation between the level of training received by lecturers and students' performance in environmental education courses. Lecturers who had undergone comprehensive professional development programs demonstrated improved teaching practices, which translated into better student engagement, critical thinking, and overall academic performance. Conversely, students taught by lecturers with limited training exposure often struggled with understanding complex environmental concepts, particularly in practical assessments where real-world application of knowledge is required. This underlines the importance of providing consistent and effective in-service training programs for lecturers, particularly in the environmental education field, where the need for informed, context-specific teaching is paramount.

Statement of the Problem

In recent years, the academic quality in Nigerian universities, particularly in environmental education programs, has been under increasing scrutiny due to alarming declines in student performance. This decline can largely be attributed to the inadequacy of structured in-service training programs for lecturers, a critical aspect of academic excellence that is often neglected. The South-South region of Nigeria, with its unique socio-political and infrastructural challenges, faces compounded difficulties in providing lecturers with adequate professional development

opportunities. The lack of investment in ongoing lecturer training undermines the ability of educators to stay updated on contemporary teaching methodologies, emerging environmental challenges, and new educational technologies. The absence of these targeted in-service training programs, such as workshops, academic exchanges, and Massive Open Online Courses (MOOCs) leaves lecturers disconnected from global educational trends and impedes their ability to provide students with a comprehensive understanding of environmental education that aligns with current global standards. The failure to bridge this gap in professional development has dire consequences for students' academic performance, particularly in a field that is essential for addressing the environmental crises facing Nigeria and the wider African continent. Without proper training, lecturers struggle to adopt student-centered teaching methods that could encourage critical thinking, creativity, and problem-solving skills in students. Consequently, students in environmental education are not adequately prepared to face the increasingly complex environmental challenges in their communities. This study seeks to investigate the significant role of in-service training in enhancing the academic performance of environmental education students in South-South Nigerian universities and looking out the urgent need for systemic reform in lecturer development to improve educational outcomes to align with global standards.

Aim and Objectives of the Study

The aim of this study is to examine the impact of lecturers' in-service training on the academic performance of environmental education students in South-South Nigeria. The specific objectives are to:

- Investigate the extent to which participation in workshops and seminars by lecturers influences the academic performance of environmental education students in South-South Nigeria.
- Examine the effect of sabbatical leave and academic exchange programs on the academic performance of environmental education students in South-South Nigeria.
- Determine the impact of lecturers' engagement in Massive Open Online Courses (MOOCs) on the academic performance of environmental education students in South-South Nigeria.
- Assess how lecturers' participation in train-the-trainer programs affects the academic performance of environmental education students in South-South Nigeria.

Research Questions

In line with the purpose of the study, the following research questions were formulated to guide the investigation:

- To what extent does lecturers' participation in workshops and seminars impact academic performance of environmental education students in South-South Nigeria?
- To what extent does lecturers' engagement in sabbatical leave and academic exchange programs impact academic performance of environmental education students in South-South Nigeria?
- To what extent does lecturers' involvement in Massive

Open Online Courses (MOOCs) impact academic performance of environmental education students in South-South Nigeria?

- To what extent does lecturers' participation in train-the-trainer programs impact academic performance of environmental education students in South-South Nigeria?

Hypotheses

The following null hypotheses were formulated to further guide the investigation and tested at .05 level of significance:

- **H₀₁:** There is no significant relationship between lecturers' participation in workshops and seminars and academic performance of environmental education students in South-South Nigeria.
- **H₀₂:** There is no significant relationship between lecturers' engagement in sabbatical leave and academic exchange programs and academic performance of environmental education students in South-South Nigeria.
- **H₀₃:** There is no significant relationship between lecturers' involvement in Massive Open Online Courses (MOOCs) and academic performance of environmental education students in South-South Nigeria.
- **H₀₄:** There is no significant relationship between lecturers' participation in train-the-trainer programs and academic performance of environmental education students in South-South Nigeria.

Theoretical Framework

The theoretical framework of this study is grounded in the Systems Theory (ST) as conceptualized by von Bertalanffy in 1968 and contemporarily applied in educational system by Ololube (2024) ^[21]. The Systems Theory provides a lens through which the interconnectedness and interdependence of various components within an organization can be examined. In the context of higher education, this theory is particularly instrumental in the understanding of how inputs, processes, and outputs operate as dynamic parts of an integrated educational system. It offers a holistic perspective that allows for the evaluation of how different interventions such as lecturers' in-service training programs contribute to institutional outcomes, especially student academic performance. The application of ST to this study explores the causal relationships between faculty development efforts and academic results among environmental education students. ST establishes a structured basis for the examination of how strategic investments in human capital development influences broader educational effectiveness. According to von Bertalanffy's Systems Theory (ST), as interpreted in the educational context by Ololube (2024) ^[21], emphasized that an institution functions as a coordinated system where each part contributes to the effectiveness of the whole. In this system, lecturers' training programs serve as crucial inputs designed to enhance human resource quality. These inputs undergo transformation through academic processes, including curriculum delivery, learner engagement, instructional innovation, and assessment strategies, which collectively constitute the transformation phase. The final outputs are observable in students' academic performance, behavioral competence, and capacity for environmental problem-solving. The theory

elucidates that disruptions or inadequacies at any point in the system such as poor training inputs or ineffective delivery mechanisms negatively affect the overall output. Hence, the quality of in-service training lecturers receive becomes crucial in maintaining the functional integrity of the university system and ensures that its core objective educational excellence is achieved.

Lecturers' participation in targeted training models, such as workshops, sabbaticals, MOOCs, and train-the-trainer programs, directly influences various subsystems within the university framework. For instance, train-the-trainer programs improve peer-to-peer knowledge dissemination and strengthen the internal instructional culture. MOOCs expose lecturers to global pedagogical practices and digital literacy, which in turn impacts the university's digital learning capabilities. Sabbatical and exchange programs contribute to intellectual diversity and curricular richness, while workshops improve content mastery and student-centric pedagogy. Through Systems Theory, these different training approaches are understood not as isolated activities but as interdependent mechanisms that collectively and connectively impacts student academic engagement, motivation, and achievement. Therefore, ST enhances specific components within the educational system, reinforces the importance of a comprehensive and multi-pronged strategy for faculty development.

Furthermore, Systems Theory offers a logical framework for structuring this study's objectives and analytical methods. The objectives are aligned with the theory's tripartite model input, process, and output that allow this research to systematically assess how in-service training (input) affects teaching methodologies (process) and student academic performance (output). Methodologically, ST supports a diagnostic approach that identified, which aspects of the educational systems are performing optimally and requires intervention. This diagnostic clarity ensures that recommendations arising from this study are not only evidence-based but also contextually integrated within the university's operational ecosystem. Hence, ST did not only provide a conceptual guide but also strengthens the internal coherence of this study by justifying its focused areas, guiding its inquiry process, and contextualizing its expected outcomes within a logically organized systemic structure.

Literature Review

Overview of Lecturers' In-service Training

In-service training refers to structured and continuous educational activities offered to employed lecturers to improve their professional knowledge, instructional methods, and overall teaching effectiveness. The core elements include pedagogical refreshers, content updates, skill acquisition workshops, curriculum review sessions, and technological integration programs. According to Amadi and Eremie (2021) ^[4], in-service training in Nigerian universities serves as a crucial mechanism for lecturer retooling, especially in specialized and evolving fields like environmental education. These programs are not merely supplemental but are instrumental in shaping lecturers' ability to deliver contextually relevant and learner-centered

instruction.

In-service training programs can be categorized into formal and informal formats, including school-based sessions, externally facilitated seminars, collaborative peer development platforms, and digital upskilling initiatives. Eze and Ikegbune (2023) ^[10], noted that school-based in-service training offers cost-effective and accessible avenues for professional learning, particularly in underfunded public institutions because government and institutional policies significantly influence the accessibility, structure, and effectiveness of lecturers' in-service training.

The Federal Ministry of Education's (2024) current strategic roadmap mandates the institutionalization of continuous professional development across all levels of higher education, emphasizing its centrality to academic excellence and global competitiveness. Furthermore, the National Universities Commission (NUC) requires regular capacity-building programs as part of its quality assurance benchmarks, compelling institutions to develop internal frameworks for monitoring and supporting lecturers' growth. However, Edo and Akangbe (2022) asserted that implementation remains inconsistent due to institutional inertia, resource constraints, and administrative lapses in many South-South universities.

Notwithstanding these policies, the actualization of effective in-service training faces persistent challenges. Funding inadequacies, bureaucratic inefficiencies, lack of staff motivation, and minimal alignment between training content and departmental needs have been widely reported. In a regional study, Effiong and Alabo (2023) ^[9], found that lecturers in Rivers and Bayelsa States expressed dissatisfaction with the relevance and frequency of existing training initiatives, calling for more discipline-specific, participatory, and needs-driven programs. Their findings suggested a systemic neglect of environmental education as a priority area within the university professional development agendas.

Moreover, there exists a noticeable gap in integrating technological advancement into in-service training structures. Uche and Ezeaku (2020) ^[20], emphasized that digital transformation in higher education requires that environmental education lecturers must be equipped with ICT competencies, digital content creation skills, and familiarity with virtual learning environments. However, the digital divide and infrastructural decay in many South-South institutions remain substantial barriers that limit the transformational impact of training programs (Ololube *et al.*, 2013) ^[23]. Therefore, stakeholders must invest in infrastructure, provide targeted digital training, and implement monitoring systems that ensure accountability and impact evaluation.

While in-service training is recognized as the cornerstone for professional growth among environmental education lecturers, its practice in South-South Nigeria remains fraught with inconsistencies and missed opportunities. For such training to translate into meaningful pedagogical transformation, it must be underpinned through robust

policy enforcement, adequate funding, and a deliberate focus on contextual relevance. According to Wali and Ololube (2016) ^[28], mitigating these challenges will not only elevate the teaching capacity of lecturers but also improve student engagement, curriculum relevance, and the global competitiveness of Nigerian universities in the environmental education domain.

Academic Performance of Environmental Education Students

Academic performance refers to the measurable outcomes of students' learning processes, commonly assessed through grade point average (GPA), examination scores, project quality, seminar presentations, and continuous assessment records. In higher education, these indicators are not only reflections of individual students' abilities but also mirror the quality of teaching and institutional capacity to support learning. For environmental education students, academic performance encompasses both theoretical understanding and practical application of interdisciplinary knowledge across environmental science, education, and policy fields. Consequently, the nature of their academic output reflects broader trends in environmental competence and sustainability literacy.

Agbor *et al.* (2023) ^[2] observed that academic performance among environmental education students in Nigerian public universities is deeply tied to the pedagogical methods employed by their lecturers. According to their study, many students encounter difficulties in courses requiring technological or experiential learning due to lecturers' limited exposure to modern instructional approaches. This issue is exacerbated because of underfunding and insufficient training of academic staff, particularly in the South-South region. In practical terms, where instructors lack the capacity to effectively integrate field-based learning or GIS technologies, students' projects and research outputs tend to reflect shallow understanding and minimal innovation.

The performance limitations signal the urgency for robust lecturer training interventions tailored to the pedagogical demands of environmental education. Agbor *et al.* (2025) ^[1] further contended that a major challenge facing environmental education students lies in the outdated curriculum content and lack of interdisciplinary integration, which reduces academic engagement and overall achievement. Their research across three federal universities in Southern Nigeria revealed that students often underperform in environmental modeling, sustainable policy design, and ecological impact assessment due to lecturers' inability to incorporate practical, real-world examples into classroom instruction. These gaps, they argued, are fundamentally linked to insufficient in-service training opportunities and the absence of institutional policies that order continuous professional development. Thus, academic success does not merely depend on students' aptitude but also the instructional competence and professional preparedness of lecturers.

Onnoghen and Obun (2022) ^[25] emphasized that academic performance in environmental education programs is sensitive to instructors' ability to guide students through interdisciplinary connections between climate change, education for sustainable development (ESD), and community action. Their study in the University of Calabar

revealed that when lecturers are trained to design participatory projects and collaborative learning activities, student outcomes improve significantly. This highlighted the strategic value of investing in professional development as a catalyst for academic excellence. Onnoghen and Obun noted that without such investments, students are less likely to develop the critical thinking, research skills, and policy orientation necessary for environmental leadership.

Additionally, empirical findings from Effiong and Alabo (2023) ^[9] in Rivers and Bayelsa State universities indicated that institutional neglect of lecturers' development programs contributes significantly to low academic morale and subpar performance among students. Their report highlighted that students who were mentored by their lecturers with recent in-service training consistently demonstrated higher research quality and greater confidence in oral defenses and fieldwork presentations. This evidence positions academic performance not as an isolated phenomenon but as a function of institutional support, lecturer motivation, and policy enforcement within departments of environmental education.

In effect, the academic trajectory of students enrolled in environmental education departments is closely aligned with the competence, innovation, and mentoring capabilities of their lecturers. Poor student performance, therefore, often reflects systemic lapses in faculty development rather than inherent student weaknesses. As institutions grapple with dwindling academic outcomes, particularly in the South-South geopolitical zone, the imperative for structured, well-funded, and policy-supported in-service training becomes ever more critical. According to Ololube and Wome (2025) ^[22], strengthening lecturer capacity through targeted training is not only a tool for improving academic performance but also a step toward enhancing regional educational competitiveness and environmental sustainability awareness.

Workshops and Seminars and Academic Performance

Participation in workshops and seminars is widely regarded as a crucial strategy for enhancing lecturers' subject knowledge and refining their teaching techniques. These professional development activities provide educators with the opportunity to engage with the latest trends, innovations, and pedagogical methods within their fields. For lecturers in environmental education, attending such forums exposes them to new research, technology, and pedagogical models that can be integrated into their teaching practices. As a result, their ability to convey complex environmental concepts effectively to students is significantly improved. Staying current with scientific advancements and educational methodologies, boost lecturers and promotes more engaging and relevant learning experiences that directly benefit student outcomes (Agbor *et al.*, 2023) ^[2]. In the context of environmental education, workshops and seminars are particularly valuable for lecturers to learn how to effectively teach sustainability, climate change, and community-based environmental projects, which are often at the heart of the curriculum.

The impact of professional development activities on students' learning outcomes is profound, both directly and indirectly. Directly, lecturers who participate in these programs are better equipped to adapt their teaching strategies, leading to more engaging and interactive lessons.

As a result, students benefit from improved instructional delivery, which enhances their understanding and retention of course material (Agbor *et al.*, 2025) ^[1]. For instance, when lecturers incorporate innovative teaching tools such as interactive simulations or real-time environmental monitoring data, students are more likely to remain engaged and motivated to excel academically. Indirectly, workshops and seminars promote a culture of continuous improvement among faculty members, which in turn cultivates a learning environment that encourages student involvement, critical thinking, and academic excellence.

Empirical studies have established a strong link between participation in workshops and seminars and improvements in students' academic motivation, retention, and performance. According to Onnoghen and Obun (2022) ^[25], universities that invest in regular faculty training report higher student retention rates and improved academic outcomes. In their study of three Nigerian universities, they found that students that are taught by lecturers who had recently attended professional development workshops showed greater academic motivation and exhibited better performance in both written examinations and project presentations. Furthermore, Effiong and Alabo (2023) ^[9], reported that in Rivers and Bayelsa State, students in environmental education programs performed better when their lecturers had attended seminars that focused on modern teaching strategies and environmental sustainability topics. This evidence supports the notion that investing in faculty development through workshops and seminars not only enhances lecturers' competence but also boosts students' academic achievement.

Additionally, the role of workshops and seminars in increasing student motivation and engagement cannot be understated. When lecturers demonstrate enthusiasm for new knowledge and teaching practices, it resonates with students, motivating them to invest more in their studies. Students are more likely to engage in active learning and retain knowledge when they perceive their lecturers as knowledgeable, dynamic, and up-to-date with current trends. This dynamic is critical for disciplines like environmental education, where the relevance of topics such as climate change, biodiversity conservation, and sustainable development are essential for student interest and academic success (Agbor *et al.*, 2025) ^[1].

Sabbatical Leave and Academic Exchange Programs and Academic Performance

Sabbatical leave and academic exchange programs are integral components of professional development strategies in higher education institutions, especially in universities. These initiatives allow academic staff to take extended periods away from their regular teaching assignments to engage in research, advanced study, or collaborative projects with partner institutions. According to Ogbonda and Nwankwo (2020) ^[20], such opportunities promote rejuvenation, intellectual exploration, and skill enhancement, which in turn contribute to the academic environment upon reintegration. Environmental education, being an interdisciplinary and rapidly evolving field, benefits significantly when lecturers utilize sabbatical periods to deepen their expertise or participate in cutting-edge research projects. The value of academic exchange lies in its ability to nurture cross-cultural collaboration, exposure

to diverse pedagogical perspectives, and professional networking.

According to Odili and Nwachukwu (2021) ^[18], when lecturers participate in international or inter-university exchange programs, they acquire new insights and instructional techniques that challenge existing norms and stimulate innovation in the home institution. This cross-pollination of ideas often translates into more engaging, and globally relevant teaching practices. Environmental education students, for instance, benefit when lecturers introduce comparative studies, integrate real-time case studies from other regions, and adopt globally accepted classroom standards. Moreover, returning lecturers often exhibit increased motivation, research productivity, and improved content delivery. These gains impact students directly, especially in courses that require contemporary knowledge and critical thinking.

Obafemi and Ituma (2022) ^[16], observed that such renewed competence among lecturers contributes to more coherent curriculum implementation, improved mentoring capacity, and higher levels of academic support. These attributes are vital for environmental education students who must understand complex, real-world issues such as biodiversity loss, waste management, and sustainability from multidisciplinary perspectives. Importantly, institutional support for sabbaticals and academic exchanges highlights a university's commitment to academic excellence. It enhances not only the lecturer's intellectual growth but also the broader learning ecosystem. Oparanma and Wali (2019) ^[26], asserted that the ripple effect of scholarly mobility strengthens institutional reputation, promotes academic innovation, and contributes to improved student academic outcomes, especially in fields that require global-local knowledge integration. In this regard, sabbatical and academic exchange schemes are not optional luxuries but strategic necessities for lecturer development and student success in Nigerian universities.

Massive Open Online Courses (MOOCs) and Academic Performance

Massive Open Online Courses (MOOCs) are rapidly transforming the higher education landscape, providing open-access digital platforms for professional development and instructional innovation. In African universities, MOOCs offer lecturers affordable, flexible, and scalable options for staying current with global pedagogical trends and subject advancements. Nte and Sunday (2021) ^[13], emphasized that MOOCs are not only reshaping knowledge dissemination but also redefining how lecturers engage with their fields and with students. For lecturers in environmental education, MOOCs present a dynamic avenue for acquiring contemporary content on climate change, environmental sustainability, and global policy frameworks. One major advantage of MOOCs is their ability to build digital literacy and expose lecturers to instructional strategies beyond traditional classroom routines. Many MOOCs are embedded with interactive tools, simulation models, and peer review mechanisms that simulate active learning environments.

Amadi and Ekeke (2020) ^[3], noted that lecturers trained through MOOCs often return to their classrooms with enhanced teaching methods that are more inclusive, participatory, and technology-driven. In environmental education, where experiential and applied learning is

crucial, MOOC-derived skills allow lecturers to use open-source simulations, visual data tools, and collaborative projects to engage students more effectively. Beyond teaching innovation, MOOCs influence lecturers' ability to stimulate academic engagement among students. Courses infused with MOOC strategies often demand greater student participation, reflective inquiry, and problem-solving all essential skills for academic success. Oparanma and Wali (2019) [26], observed that students that are taught by MOOC-trained lecturers tend to develop stronger independent learning skills and show greater enthusiasm toward self-directed research. Environmental education students, in particular, benefit from the broader exposure to interdisciplinary resources, digital archives, and virtual case studies often introduced through such open-source training. Furthermore, MOOCs serve as bridges between local academic practices and international standards. Aligning lecturers' competencies with global expectations in MOOCs helps in the promotion of learning environment that encourages regional competitiveness and academic excellence. According to Obafemi and Ituma (2022) [16], institutions that integrate MOOC-inspired methodologies often report improvements in student learning outcomes, project quality, and exam performance. Thus, MOOCs do not only represent a technological trend but a transformative educational force that strengthens the academic infrastructure and enhances the performance of students across disciplines, especially in environmentally focused programs.

Train-the-Trainer Programs and Academic Performance

Train-the-Trainer (TTT) programs represent structured professional development models where select faculty members undergo intensive training in specific pedagogical or disciplinary innovations and subsequently return to their institutions to disseminate the acquired knowledge and skills. In the context of tertiary education, these programs are particularly significant as they enable continuous peer-to-peer knowledge transmission, thus building internal academic capacity (Oparanma & Wali, 2019) [26]. TTT models have proven to be a strategic tools in addressing the uneven distribution of expertise among lecturers in Nigerian universities, especially in emerging areas such as environmental education, digital pedagogy, and student-centered teaching methods. Equipping lecturers with advanced instructional methodologies, helps institutions create localized resource persons capable of enhancing departmental teaching practices.

Trained lecturers often serve as multipliers, cascading their newly acquired competencies through departmental seminars, peer mentoring sessions, and curriculum design workshops (Amadi & Ekeke, 2020) [3]. This cascading effect encourages collaborative learning among faculty and promotes a culture of shared professional growth. In many South-South Nigerian institutions, particularly in Rivers and Bayelsa States, such TTT programs have been instrumental in aligning traditional lecture-based methods with more interactive and participatory pedagogies. The benefit is dual: while the immediate trainees are empowered, the extended faculty network also benefits from indirect exposure, leading to a gradual elevation in instructional quality across departments.

Empirical studies have demonstrated that classrooms that are led by TTT-trained lecturers often reflect higher student engagement, deeper conceptual understanding, and improved academic outcomes. For instance, Odili and Nwachukwu (2021) [18], observed that student cohorts taught by lecturers who had participated in TTT-based curriculum reform initiatives scored significantly better in project-based assessments and group presentations. Similarly, Ogbonda and Nwankwo (2020) [20], found a positive correlation between departments with a higher number of TTT-trained faculty and student satisfaction levels, as measured through internal course evaluation tools. These findings suggest that the quality of teaching is not solely dependent on the number of years of service or academic qualification but significantly influenced by the extent of practical, peer-led professional development.

In addition to improving individual lecturer performance, TTT programs contribute to broader institutional goals, such as accreditation readiness, competitive grant applications, and regional academic leadership. Nte and Sunday (2021) [13], noted that universities that encourages structured TTT models tend to outperform their counterparts in national education rankings, particularly in metrics relating to student retention and program completion rates. Moreover, the impact of TTT models on academic performance becomes more visible in disciplines like environmental education, where interdisciplinary knowledge and field-based skills are essential. Integrating TTT into institutional development frameworks can assist universities not only to improve teaching quality but also build resilient systems for sustained academic excellence.

Methodology

This study adopted descriptive and correlational research designs, which are appropriate for investigating the relationship between lecturers' in-service training and the academic performance of environmental education students in public universities. The choice of this design is premised on its capacity to identify the degree and direction of associations among variables without manipulating the study environment, and also ensures that the natural setting of educational operations is maintained. The designs also allow the researchers to study phenomena as they occur in their real-life context, particularly in understanding the influence of professional development efforts on student outcomes. The population of the study comprised of all lecturers and final-year undergraduate students in the Department of Environmental Education across public universities in the South-South geopolitical zone of Nigeria. These institutions were selected due to their relevance in producing environmentally conscious graduates and their increasing emphasis on lecturer development programs. The population was considered appropriate for the capturing of the diverse range of experiences, professional training exposures, and academic performance trends among environmental education students.

A sample size of 549 respondents was determined using Taro Yamane's formula, which ensures representativeness while accounting for a retrieval of 532 valid copies of the instrument distributed to the sampled respondents. A stratified random sampling technique was used to select participants across institutions to ensure that every university department had proportional representation of

lecturers and students. The stratification was based on institutional size and academic levels to certify that all relevant sub-groups were represented in the study. This sampling strategy was adopted to reduce bias and promote the generalizability of findings across the region. The primary research instrument for data collection was a structured questionnaire designed by the researchers. The instrument was divided into three sections: Section A captured demographic data; Section B assessed various components of lecturers' in-service training (such as workshops, academic exchanges, and MOOCs); while Section C focused on students' academic performance indicators including cumulative grade point average (CGPA), course completion rate, and practical project ratings. The items in the instrument were carefully developed based on extensive literature to align with the research objectives.

To ensure validity, the instrument underwent expert judgment review by specialists in educational measurement, environmental education, and university pedagogy. Their suggestions were incorporated to refine the clarity, relevance, and comprehensiveness of the items. For reliability, a pilot test was conducted involving 30 participants from the non-sampled institution within the South-South zone. The internal consistency of the instrument was computed using the Cronbach Alpha method and the result yielded a coefficient of .874, indicating high reliability and the consistency of the questionnaire items.

Data collection involved direct administration of hard copies of the questionnaire to participants during lecture periods, departmental seminars, and training programs. In addition, for institutions with logistical limitations, an online version of the questionnaire was distributed via email and academic WhatsApp platforms to ensure comprehensive reach. The data collected were coded and entered into the Statistical Package for the Social Sciences (SPSS) version 29 for analysis. Mean and standard deviation were used to answer the research questions to provide insights into the central tendencies and spread of responses. To test the study's hypotheses, Pearson Product Moment Correlation (PPMC) technique was employed and tested at .05 level of significance to determine the strength and direction of the relationships between lecturers' in-service training and students' academic performance.

Results

The following research questions were answered using mean and standard deviation responses. Where a mean score of 2.5 and above was considered a High Extent, while a mean score of 2.49 or lower was regarded as a Low Extent in this research questions interpretations.

Research Question 1: To what extent does lecturers' participation in workshops and seminars impact academic performance of environmental education students in South-South Nigeria?

Table 1: Summary of mean and standard deviation responses on the extent lecturers' participation in workshops and seminars impact academic performance of environmental education students in South-South Nigeria

S/N	Participation in Workshops and Seminars	Mean	SD.	Remark
1.	Lecturers' attendance at workshops improves their teaching strategies for better student academic performance.	2.5194	1.01374	High Extent
2.	Students benefit academically from lecturers who frequently participate in professional seminars.	2.8660	1.14669	High Extent
3.	Participation in educational workshops enhances lecturers' knowledge of current environmental education trends.	2.6433	1.13342	High Extent
4.	Workshops and seminars empower lecturers to develop innovative teaching methods that support students' academic success.	2.8320	1.11982	High Extent
	Grand Mean	2.7151	1.10343	High Extent

Table 1 presents the mean and standard deviation of responses on how lecturers' participation in workshops and seminars relates to students' academic performance in environmental education across South-South Nigeria. The data revealed that all the items recorded mean values above the benchmark of 2.50, which indicates a generally high perception of influence. For instance, the participation of lecturers in educational workshops to enhance their knowledge of environmental education trends (Mean = 2.6433, SD = 1.13342), and the ability of such forums to empower lecturers in developing innovative teaching methods (Mean = 2.8320, SD = 1.11982) were both acknowledged as having a high extent of impact. Additionally, attendance at workshops improving teaching strategies (Mean = 2.5194, SD = 1.01374) was also

positively rated. However, the item suggesting that students benefit academically from lecturers who frequently attend professional seminars (Mean = 2.8660, SD = 1.14669) was also rated high, which indicates no perceived gaps in direct student benefits. The overall grand mean of 2.7151 and a standard deviation of 1.10343 supports the conclusion that participation in workshops and seminars contributes significantly to academic outcomes of students, although there is a need to strengthen the direct transference of seminar experiences to student academic benefits.

Research Question 2: To what extent does lecturers' engagement in sabbatical leave and academic exchange programs impact academic performance of environmental education students in South-South Nigeria?

Table 2: Summary of Mean and standard deviation responses on the extent lecturers' engagement in sabbatical leave and academic exchange programs impact academic performance of environmental education students in South-South Nigeria

S. N.	Engagement in Sabbatical Leave	Mean	SD.	Remark
1.	Academic exchange programs expose lecturers to global practices that enhance student academic outcomes.	2.8666	1.11399	High Extent
2.	Sabbatical leave opportunities allow lecturers to conduct research that positively impacts their classroom delivery.	2.6728	1.08483	High Extent
3.	Students' academic performance is influenced by the enriched knowledge lecturer's gain from sabbatical programs.	2.7205	1.10451	High Extent
4.	Inter-university collaborations through academic exchanges improve the overall quality of teaching and learning.	2.5351	1.09025	High Extent
5.	Grand Mean	2.6987	1.09839	High Extent

Table 2 displays the aggregated responses concerning the extent of influence of lecturers' engagement in sabbatical leave and academic exchange programs on students' academic performance. All listed items showed mean values above 2.5, suggesting a unanimous recognition of the high impact such engagements have. Respondents noted the significance of academic exchange programs in exposing lecturers to global best practices (Mean = 2.8666, SD = 1.11399), which in turn support better student outcomes. Similarly, sabbatical leaves enabling lecturers to conduct impactful research (Mean = 2.6728, SD = 1.08483), and the positive influence of such programs on students through enriched content delivery (Mean = 2.7205, SD = 1.10451)

were highly rated. The contribution of inter-university collaborations (Mean = 2.5351, SD = 1.09025) was also acknowledged. The grand mean of 2.6987 and standard deviation of 1.09839 reflect a strong consensus on the significant role these professional engagements play in improving the academic performance of environmental education students, underscoring the importance of structured sabbatical and exchange opportunities for lecturers.

Research Question 3: To what extent does lecturers' involvement in Massive Open Online Courses (MOOCs) impact academic performance of environmental education students in South-South Nigeria?

Table 3: Summary of Mean and standard deviation responses on the extent lecturers' involvement in Massive Open Online Courses (MOOCs) impact academic performance of environmental education students in South-South Nigeria

S.N.	Involvement in Massive Open Online Courses	Mean	SD.	Remark
1.	MOOCs provide lecturers with advanced instructional tools that enhance student learning outcomes.	2.6180	1.13386	Low extent
2.	Students benefit when lecturers apply innovative ideas acquired from MOOCs in their teaching.	2.6390	1.15970	High Extent
3.	Lecturers' participation in MOOCs leads to improved curriculum content delivery.	2.5197	1.09321	High Extent
4.	Exposure to MOOCs equips lecturers to meet diverse student academic needs effectively.	2.6264	1.10911	High Extent
	Grand Mean	2.6007	1.12397	High Extent

Table 3 outlines the perceptions of respondents regarding how MOOCs influence student academic performance in environmental education. The data indicates that most items achieved mean values above the 2.5 threshold, suggesting that MOOCs are generally perceived to have a positive impact. Specifically, students reportedly benefit when lecturers apply innovative ideas acquired from MOOCs (Mean = 2.6390, SD = 1.15970), and improved curriculum delivery (Mean = 2.5197, SD = 1.09321) is also a noted outcome. Additionally, lecturers' exposure to MOOCs was seen as enhancing their ability to meet diverse student academic needs (Mean = 2.6264, SD = 1.10911). However,

the item assessing whether MOOCs provide advanced instructional tools (Mean = 2.6180, SD = 1.13386) received a high rating as well, which suggests a strong perceptions in all specific area. The grand mean of 2.6007 and standard deviation of 1.12397 indicate that MOOCs generally contribute positively to students' academic success.

Research Question 4: To what extent does lecturers' participation in train-the-trainer programs impact academic performance of environmental education students in South-South Nigeria?

Table 4: Summary of Mean and standard deviation responses on the extent lecturers' participation in train-the-trainer programs impact academic performance of environmental education students in South-South Nigeria

S. N	Train-the-Trainer Programs Participation	Mean	SD.	Remark
1.	Lecturers who participate in train-the-trainer programs tend to share updated knowledge with students.	2.6587	1.12763	High Extent
2.	Student academic performance improves when lecturers cascade new teaching skills from training sessions.	2.6414	1.12934	High Extent
3.	Train-the-trainer programs increase lecturer confidence in delivering complex environmental topics.	2.5253	1.12355	High Extent
4.	Students perform better academically when their lecturers are periodically retrained through peer-led development sessions.	2.5478	1.10132	High Extent
	Grand Mean	2.5933	1.10431	High Extent

Table 4 presents respondents' views on how train-the-trainer programs affect students' academic performance. All items had mean values above the 2.5 benchmark, indicating a widely held belief in the effectiveness of such programs. Lecturers' dissemination of updated knowledge gained through training (Mean = 2.6587, SD = 1.12763), and the improvement in student academic performance following the cascading of new teaching skills (Mean = 2.6414, SD = 1.12934) were both rated high. Similarly, participation in train-the-trainer sessions boosting lecturer confidence in handling complex content (Mean = 2.5253, SD = 1.12355), and periodic retraining through peer-led development

leading to better academic performance (Mean = 2.5478, SD = 1.10132) were acknowledged. The grand mean of 2.5933 and a standard deviation of 1.12046 reflect a positive overall perception, which supports the idea that such structured retraining efforts play a valuable role in enhancing students' academic outcomes in environmental education.

Test of Hypotheses

HO₁: There is no significant relationship between lecturers' participation in workshops and seminars and academic performance of environmental education students in South-South Nigeria.

Table 5: Summary of Pearson's Product Moment Correlation Coefficient (PPMC) on the relationship between lecturers' participation in workshops and seminars and academic performance of environmental education students in South-South Nigeria

		Workshops and Seminars	Academic Performance
Workshops and Seminars	Pearson Correlation	1	.817
	Sig. (2-tailed)		.000
	N	532	532
Academic Performance	Pearson Correlation	.817	1
	Sig. (2-tailed)	.000	
	N	532	532

Table 5 presents the result of the Pearson's Product Moment Correlation Coefficient (PPMC) conducted to examine the relationship between lecturers' participation in workshops and seminars and the academic performance of environmental education students in South-South Nigeria. The correlation coefficient obtained is .817, which indicates a strong positive relationship between the two variables. This means that as lecturers participate more in workshops and seminars, the academic performance of environmental education students tends to improve correspondingly. Furthermore, the associated p-value is .000, which is less than the alpha level of .05. This implies that the relationship observed is statistically significant and not due to chance.

Therefore, the null hypothesis which states that there is no significant relationship between lecturers' participation in workshops and seminars and academic performance of environmental education students in South-South Nigeria is rejected. It can thus be inferred that lecturers' participation in such in-service training activities is significantly related to better academic outcomes among students.

HO₂: There is no significant relationship between lecturers' engagement in sabbatical leave and academic exchange programs and academic performance of environmental education students in South-South Nigeria.

Table 6: Summary of Pearson's Product Moment Correlation Coefficient (PPMC) on the relationship between lecturers' engagement in sabbatical leave and academic exchange programs and academic performance of environmental education students in South-South Nigeria

		Sabbatical Leave	Academic Performance
Sabbatical Leave	Pearson Correlation	1	.712
	Sig. (2-tailed)		.001
	N	532	532
Academic Performance	Pearson Correlation	.712	1
	Sig. (2-tailed)	.001	
	N	532	532

The statistical summary in Table 6 revealed a Pearson correlation coefficient of .712 between lecturers' engagement in sabbatical leave and academic exchange programs and students' academic performance. This value suggests a substantial and positive correlation, indicating that increased engagement in sabbatical leave and academic exchange programs by lecturers is associated with higher academic performance among environmental education students. The significance level associated with this correlation is .001, which is well below the .05 threshold. This confirms that the relationship is statistically meaningful. Given this result, the null hypothesis is rejected.

The implication of this finding is that sabbatical leave and academic exchange opportunities provide lecturers with broader academic exposure and enhanced instructional competence, which may translate into more effective teaching and improved learning outcomes for students in the South-South region of Nigeria.

HO₃: There is no significant relationship between lecturers' involvement in Massive Open Online Courses (MOOCs) and academic performance of environmental education students in South-South Nigeria.

Table 7: Summary of Pearson's Product Moment Correlation Coefficient (PPMC) on the relationship between lecturers' involvement in Massive Open Online Courses (MOOCs) and academic performance of environmental education students in South-South Nigeria

		Massive Open Online Courses	Academic Performance
Massive Open Online Courses	Pearson Correlation	1	.679
	Sig. (2-tailed)		.005
	N	532	532
Academic Performance	Pearson Correlation	.679	1
	Sig. (2-tailed)	.003	
	N	532	532

Table 7 summarized the analysis of the relationship between lecturers' involvement in MOOCs and the academic performance of environmental education students. The Pearson correlation coefficient is .679, which suggests a significant relationship between the two variables. This means that increased involvement of lecturers in MOOCs is moderately linked to improved academic performance among students. The p-value is .005, which is less than .05, confirms that the correlation is statistically significant. Based on this evidence, the null hypothesis is rejected. This finding suggests that participation in MOOCs, which are

flexible and often cutting-edge platforms for academic development, has the potential to enrich lecturers' pedagogical skills and content knowledge, thereby improving the academic achievement of environmental education students positively.

HO₄: There is no significant relationship between lecturers' participation in train-the-trainer programs and academic performance of environmental education students in South-South Nigeria.

Table 8: Pearson's Product Moment Correlation Coefficient (PPMC) on the relationship between lecturers' participation in train-the-trainer programs and academic performance of environmental education students in South-South Nigeria

		Train-the-Trainer Programs	Academic Performance
Train-the-Trainer Programs	Pearson Correlation	1	.815
	Sig. (2-tailed)		.000
	N	532	532
Academic Performance	Pearson Correlation	.815	1
	Sig. (2-tailed)	.000	
	N	532	532

From the data presented in Table 8, the Pearson correlation coefficient is .815, which indicates a strong and positive relationship between lecturers' participation in train-the-trainer programs and the academic performance of environmental education students. This suggests that increased involvement in such programs is significantly associated with better academic outcomes for students. Additionally, the significance value is .000, which is far below the standard threshold of .05. This confirms that the observed relationship is statistically significant. Consequently, the null hypothesis is rejected. This result implies that train-the-trainer programs, are typically designed to equip lecturers with advanced teaching techniques and updated knowledge, play an important role in enhancing the academic performance of students in the field of environmental education in South-South Nigeria.

Discussion of Findings

Workshops and Seminars and Academic Performance of Environmental Education Students

The study examined the relationship between lecturers' participation in workshops and seminars and the academic performance of environmental education students in South-South Nigeria. The Pearson correlation coefficient of .817 with a p-value of .000 ($p < .05$) shows a strong positive relationship between the two variables. This result led to the rejection of the null hypothesis (HO_1), thereby indicating that lecturers' participation in workshops and seminars significantly influences the academic performance of environmental education students in the region. This finding is in agreement with a study by Eze and Ikegbune (2023)

^[10], who reported a strong correlation between professional training workshops and student achievement in Nigerian tertiary institutions. Eze and Ikegbune's study noted that lecturers who regularly attend well-structured workshops tend to adopt improved instructional practices that reflect in students' academic progress. This supports the current study's observation that workshops and seminars enhance instructional effectiveness. Similarly, Wali and Ololube (2016) ^[28], found that seminars organized within academic departments helped promote collaborative learning and sharpened lecturers' content delivery.

They argued that consistent participation in such professional development initiatives enhances lecturers' ability to deliver curriculum content in engaging ways, a result that aligns with the findings of this current study. In addition, Effiong and Alabo (2023) ^[9], observed that regular exposure to workshop-based learning opportunities equips lecturers with modern teaching techniques and evaluation strategies. This supports the outcome of the present research, suggesting that workshops and seminars play a vital role in enhancing academic standards among students. The findings from this study affirm the critical impact of workshops and seminars on students' academic performance. They resonate with existing literature which points to the benefits of professional development opportunities in strengthening lecturers' instructional competencies. This has important implications for institutional administrators and educational policymakers in South-South Nigeria, especially in designing in-service training programs that directly support students' academic outcomes.

Sabbatical Leave and Academic Exchange Programs and Academic Performance of Environmental Education Students

The study assessed the relationship between lecturers' engagement in sabbatical leave and academic exchange programs and the academic performance of environmental education students in South-South Nigeria. The Pearson correlation coefficient obtained was .712 with a p-value of .001 ($p < .05$), indicating a strong and statistically significant relationship. This finding necessitated the rejection of the null hypothesis (H_{02}), confirming that sabbatical leave and academic exchange opportunities significantly affect students' academic performance. To support this finding, Odili and Nwachukwu (2020) discovered that sabbatical experiences enable lecturers to gain exposure to global best practices, which positively affect their teaching quality upon return. Their study, conducted across selected Nigerian universities, found that lecturers who had undertaken academic exchange programs integrated diverse pedagogical approaches that stimulated student learning, a perspective echoed by the current study. Likewise, Obafemi and Ituma (2022) [16], established that sabbatical leave offers opportunities for academic rejuvenation, often translating into renewed teaching strategies and improved content delivery. According to their findings, when lecturers engage in such academic mobility, they return with innovative ideas that directly influence student learning outcomes a notion corroborated by the present research. Furthermore, Oparanma and Wali (2019) [26], argued that exposure to cross-institutional academic environments provides lecturers with up-to-date knowledge and a broader perspective, which enhances both research output and classroom effectiveness.

These reports agree with the results of the current study, emphasizing the linkage between academic exchange programs and improved student academic achievements. In summary, the findings from this study highlight the essential role of sabbatical leave and academic exchange programs in enhancing academic performance. The results are consistent with previous studies, underlining how global academic exposure equips lecturers with enriched knowledge and teaching methodologies that benefit students. This offers insight for university management in South-South Nigeria to encourage more structured sabbatical and exchange policies that support continuous academic improvement.

Massive Open Online Courses (MOOCs) and Academic Performance of Environmental Education Students

The study investigated the relationship between lecturers' involvement in Massive Open Online Courses (MOOCs) and the academic performance of environmental education students in South-South Nigeria. The Pearson correlation coefficient was .679 with a p-value of .005 ($p < .05$), indicating a moderate but significant positive relationship. This led to the rejection of the null hypothesis (H_{03}), suggesting that MOOCs play a noteworthy role in improving student academic outcomes. In support of this finding, Nte and Sunday (2021) [13], found that MOOCs enhance lecturers' access to up-to-date academic content, helping them stay current with global trends and methodologies. Their research established that lecturers who frequently engaged with MOOCs were more technologically inclined and presented their lessons with enriched digital

resources a trend also observed in the present study. Amadi and Ekeke (2020) [3], reported similar findings, highlighting that MOOCs serve as cost-effective platforms for continuing education, especially for academic staff in resource-constrained academic environments.

According to their study, lecturers who maximized these platforms brought greater innovation and efficiency into the classroom, thereby positively influencing student performance, which is in line with this study's findings. Again, Oparanma and Wali (2019) [26], emphasized the transformative potential of MOOCs in higher education, particularly in professional development. They argued that MOOCs empower lecturers with access to global expertise and diverse course structures, which translate into enriched classroom interactions and improved learning outcomes for students. This reinforces the current study's finding that lecturers' participation in MOOCs correlates with academic gains among students. These findings underscore the growing importance of digital learning platforms in professional development. The evidence suggests that lecturers' engagement in MOOCs contributes significantly to improved academic performance among students in environmental education. This calls for institutional support for online learning initiatives as a cost-effective strategy for enhancing instructional quality in tertiary institutions across South-South Nigeria.

Train-the-Trainer Programs and Academic Performance of Environmental Education Students

This study investigated the relationship between lecturers' participation in train-the-trainer programs and the academic performance of Environmental Education students in South-South Nigeria. The statistical analysis revealed a Pearson correlation coefficient of .815, accompanied by a p-value of .000 ($p < .05$), which signifies a strong and statistically significant positive relationship between the two variables. The implication of this outcome is that lecturers who are actively engaged in train-the-trainer programs tend to contribute more positively to the academic success of their students. As a result, the null hypothesis (H_{04}), which proposed that there is no significant relationship between lecturers' participation in train-the-trainer programs and students' academic performance, was rejected. This finding substantiates the assertion that such capacity-building initiatives for lecturers significantly impact the learning outcomes of students within the domain of Environmental Education, particularly in the South-South region of Nigeria. This result draws support from the work of Amadi and Ekeke (2020) [3], who found that train-the-trainer programs offer a structured and replicable approach to the dissemination of teaching skills. Their research revealed that when lecturers are equipped through such programs, they tend to disseminate the acquired knowledge to their colleagues, thereby creating a multiplier effect within their departments. They further asserted that these trained lecturers evolve into academic leaders and catalysts for change, promoting an environment where teaching excellence is promoted, ultimately benefiting students' academic engagement and performance. This finding is in line with the current study's results, which emphasize that participation in structured professional development directly influences students' academic achievement by enhancing lecturers' teaching effectiveness.

Further support comes from the Oparanma and Wali (2019)^[26], their findings highlighted that lecturers who have undergone such training do not merely apply what they have learned in isolation; instead, they become mentors to other teaching staff, leading to a broader transformation in instructional approaches across faculties. Researchers (e.g., Ololube, 2024; Ololube & Wome, 2025)^[21, 22] have noted that mentoring framework promotes collaborative learning among lecturers, continuous pedagogical improvement, and consistent refinement of curriculum delivery. Consequently, students experience a more robust and engaging academic environment, which directly contributes to their academic performance. This reinforces the current study's assertion that institutionalizing train-the-trainer programs could yield systemic benefits across the educational landscape.

Additionally, the findings from Odili and Nwachukwu (2021)^[18] provided further affirmation of the value of train-the-trainer interventions in higher education. Their study revealed that such programs are typically designed to be hands-on and experiential, allowing lecturers to deeply engage with both content knowledge and contemporary pedagogical techniques. These researchers discovered that lecturers who participated in train-the-trainer programs were more likely to embrace student-centered instructional methods, introduce active learning strategies, and integrate technology-enhanced teaching tools in their classrooms. The cumulative effect on these changes led to a more stimulating and effective learning environment for students. These insights strongly correspond with the present study's outcomes, which demonstrate that students taught by lecturers who benefitted from train-the-trainer programs performed better academically due to the innovative and engaging methods employed by such instructors.

Therefore, the findings of this study underscore the significant and positive impact of train-the-trainer programs on students' academic performance, particularly within Environmental Education departments in South-South Nigeria. The study aligns with a body of existing literature which consistently identifies these programs as pivotal in building lecturers' pedagogical capacity, promoting departmental collaboration, and enhancing student learning outcomes. The implication for educational policymakers and institutional administrators is clear investment in train-the-trainer programs should be prioritized as a core strategy for improving the quality of teaching and learning in tertiary institutions. The processes in scaling up these initiatives and institutionalizing peer-mentorship structures, tertiary institutions in South-South Nigeria can realize sustainable improvements in academic performance and overall educational excellence.

Conclusion

The study investigated the relationship between lecturers' in-service training and the academic performance of environmental education students in South-South Nigeria. The findings revealed that components of in-service training namely workshops and seminars, sabbatical leave and academic exchange programs, massive open online courses (MOOCs), and train-the-trainer programs significantly influence the academic success of students. Data analysis emphasized that lecturers who actively participate in structured and well-coordinated in-service training are better equipped with contemporary teaching strategies, updated

content knowledge, and instructional innovations that translate into improved academic outcomes for students. The study emphasized the pivotal role of continuous professional development in building a high-performing academic workforce and ensuring quality education delivery in environmental education. The study established that effective implementation of in-service training is a vital mechanism for enhancing both teaching effectiveness and students' academic performance across universities in South-South Nigeria. Moving forward, it is crucial for policymakers and university administrators to institutionalize professional development programs as a strategic approach for sustaining academic excellence and educational relevance.

Recommendations

Based on the findings of the study on lecturers' in-service training and students' academic performance, the following recommendations are made:

- University management should consistently organize discipline-specific workshops and seminars tailored to emerging issues in environmental education to equip lecturers with up-to-date knowledge, innovative teaching techniques, and pedagogical strategies that directly enhance students' learning experiences.
- Policy frameworks should be developed to encourage and support lecturers' access to sabbatical leave and international academic exchange programs, ensuring such programs are tied to well-defined academic deliverables that enhance teaching quality and student engagement upon return.
- Educational stakeholders and university ICT units should collaborate to improve access to and utilization of Massive Open Online Courses (MOOCs) by integrating them into faculty development plans and incentivizing lecturers to pursue certified online courses aligned with their teaching responsibilities.
- Universities should adopt and scale up structured train-the-trainer programs by selecting experienced lecturers to undergo intensive training and subsequently mentor their peers, thereby promoting internal knowledge transfer and sustainable improvements in teaching practices that lead to better academic performance among students.

References

1. Agbor CN, Etan MO, Akuji RT, Etim REO. Impact of information communication technology (ICT) on students' academic performance in the Department of Environmental Education, University of Calabar, Nigeria. *Int J Leadership Qual Educ Afr Dev*. 2025;2(1):20-38.
2. Agbor CN, Onnoghen UN, Etan MO. Teachers' qualification and academic performance of environmental education students in the University of Calabar. *LWATI: A J Contemp Res*. 2023;20(2):2-12.
3. Amadi EC, Ekeke H. Improving teachers' instructional competence through virtual learning platforms in tertiary institutions in Nigeria. *Afr J Educ Manag*. 2020;18(2):92-104.
4. Amadi OA, Eremie MD. In-service training and lecturers' instructional delivery in Nigerian public universities. *Int J Educ Res Dev*. 2021;8(2):45-54.

5. Amadi OE, Eze SM. The role of lecturers' professional development in improving teaching quality in environmental education in Nigerian universities. *J Educ Dev.* 2019;15(2):115-130.
6. Ambe BA, Agbor CE, Ephraim IE, Eneyo OE, Asuquo EE, Etan MO, *et al.* Multimedia learning technologies and environmental education pedagogy in tertiary institutions in Nigeria. *Soc Sci Humanit Open.* 2023. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4462053
7. Bertalanffy L von. *General system theory: Foundations, development, applications.* New York: George Braziller; 1968.
8. Edo JO, Akangbe CA. Challenges of professional development policies in Nigerian tertiary education system: A case study of South-South universities. *J Educ Leadersh Policy Stud.* 2022;5(3):99-112.
9. Effiong BJ, Alabo TA. Institutional neglect and professional stagnation: A study of in-service training in Bayelsa and Rivers State universities. *Niger J Contemp Educ.* 2023;12(1):70-84.
10. Eze PU, Ikegbune KE. Optimizing in-service training for improved teaching efficiency in public higher institutions in Delta State. *Afr J High Educ Innov.* 2023;10(4):121-135.
11. Federal Ministry of Education. *Strategic roadmap for higher education development 2024–2028.* Government of Nigeria; 2024 [cited 2024]. Available from: <https://education.gov.ng/strategic-roadmap-2024>
12. Iyalla BE, Opuwari CT. Challenges and opportunities of Massive Open Online Courses (MOOCs) in higher education in Nigeria. *Niger J Educ Technol.* 2021;10(1):34-49.
13. Nte AR, Sunday TJ. MOOCs and digital transformation of teacher education in sub-Saharan Africa: Opportunities and barriers. *Int J ICT Educ.* 2021;13(1):55-70.
14. Nte PU, Sunday ST. Sustaining academic quality through professional development of university lecturers in Nigeria. *Afr J Educ Res Adm.* 2021;14(2):55-67.
15. Nwine IN, Egbezor DE. Assessing the impact of sabbaticals and academic exchange programs on lecturers' professional development in South-South Nigeria. *J High Educ Policy.* 2022;22(3):256-270.
16. Obafemi OE, Ituma EA. Sabbatical leave, international collaboration, and academic productivity among Nigerian university lecturers. *Niger J Res Dev High Educ.* 2022;16(3):73-88.
17. Obomanu GI. In-service training for lecturers in Nigerian universities: Challenges and policy implications. *Niger J Educ Res.* 2023;16(4):67-80.
18. Odili JN, Nwachukwu CC. Impact of professional development programmes on academic staff productivity in Nigerian public universities. *Int J High Educ Res.* 2021;5(2):88-103.
19. Odum OS, Kalagbor II. The role of train-the-trainer programs in improving teaching quality among university lecturers in Nigeria. *Int J Educ Leadersh.* 2020;19(2):112-126.
20. Ogbonda GN, Nwankwo EJ. Professional development and students' academic performance in South-South Nigerian universities. *Rivers State J Educ Stud.* 2020;6(1):120–135.
21. Ololube NP. *Institutional leadership: Laying the foundation for success.* Port Harcourt: Pearl Publications; 2024.
22. Ololube NP, Wome MOE. *Principles of green human resource management: Theory and practice.* Port Harcourt: Pearl Publishers; 2025.
23. Ololube NP, Kpolovie PJ, Amaele S, Amanchukwu RN, Briggs T. Digital natives and digital immigrants: a study of information technology and information systems (IT/IS) usage between students and faculty of Nigerian universities. *Int J Inf Commun Technol Educ.* 2013;9(3):42-64. DOI: 10.4018/jicte.2013070104.
24. Omoregie DI, Ogundele OF. Exploring the link between lecturer professional development and students' academic performance in environmental education. *J Environ Educ.* 2020;14(2):102-115.
25. Onnoghen UN, Obun MO. Teachers' qualifications and academic performance of environmental education students in University of Calabar. *LWATI: A J Contemp Res.* 2022;19(3):45-58.
26. Oparanma AO, Wali WA. Institutional policies and the promotion of lecturer capacity building in Nigeria's public universities. *J Contemp Educ Policy.* 2019;11(2):89-102.
27. Uche IF, Ezeaku MI. Bridging the digital divide through ICT-based in-service training in Nigerian universities. *J Technol Teach Educ Afr.* 2020;7(2):55-67.
28. Wali WI, Ololube NP. The in-service education needs of administrators and the human resources management (HRM) of Colleges of Education in Nigeria. *Br J Educ Soc Behav Sci.* 2016;17(3):1-18. DOI: 10.9734/BJESBS/2016/28246