

Integrating Urban Sustainability Education into the Curricula of Tertiary Institutions in Calabar Metropolis: Challenges and Opportunities

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Abstract

The study aimed to investigate the integration of Urban Sustainability Education into the curricula of tertiary institutions in Calabar Metropolis, with a particular focus on identifying existing challenges and exploring opportunities for effective implementation. The specific objectives were to identify the key challenges hindering the integration of urban sustainability education into the curricula and to explore opportunities and potential strategies for promoting such education in the University of Calabar (UNICAL) and the Cross River University of Technology (CRUTECH). A descriptive survey research design was adopted for the study. Both primary and secondary sources of data were utilized. The primary data were obtained through structured questionnaires administered to lecturers, students, and curriculum developers, while secondary data were drawn from journals, reports, and policy documents. A sample size of 120 respondents was selected using a stratified random sampling technique to ensure representation from both institutions. Findings revealed several challenges such as lack of institutional policy support, inadequate training of educators, poor funding, and limited awareness about the concept of urban sustainability. However, opportunities such as the availability of environmental science programs, partnerships with sustainability-oriented NGOs, and the rising global emphasis on sustainable development were identified. Hypothesis testing using chi-square analysis showed a statistically significant relationship between the identified challenges and the level of integration of urban sustainability education in the selected institutions. The study concluded that without deliberate and strategic efforts, urban sustainability education will remain marginal in tertiary institutions in Calabar. One key recommendation is that educational policymakers should incorporate sustainability education as a core component of tertiary curricula through curriculum review and stakeholder collaboration.

Keywords: Urban Sustainability, Tertiary Education, Curriculum Integration, Calabar Metropolis, Educational Challenges

Introduction

In recent decades, urban sustainability has become a central theme in global development discourse due to the mounting challenges associated with urbanization, climate change, and

environmental degradation (Almulhim, & Cobbinah, 2024). Urban sustainability education focuses on equipping learners with the necessary knowledge, skills, and values to promote environmentally responsible urban living and foster resilience in cities. Globally, several higher institutions have made strides in integrating sustainability into academic curricula to prepare students for the complexities of urban development and environmental stewardship (Abo-Khalil, 2024). Key variables such as curriculum reform, institutional capacity, stakeholder engagement, and policy support play a pivotal role in mainstreaming sustainability education in tertiary institutions (Shrestha, 2024).

Across Africa, the challenge of sustainable urbanization is compounded by inadequate infrastructure, rapid population growth, and environmental neglect. While there is increasing advocacy for sustainability in higher education, many African universities continue to struggle with outdated curricula, insufficient funding, and limited expertise in sustainability-related fields (Daniels, 2022). Although some countries like South Africa and Kenya have recorded modest progress in integrating sustainability education, the broader African context still reflects a significant gap between policy intentions and educational practice (Gremaud, & Kochtcheeva, 2024). This gap continues to hinder the continent's ability to build urban resilience and develop a generation of graduates capable of addressing sustainability challenges.

In Nigeria, the issue of urban sustainability is particularly critical due to the country's fast-growing urban population and widespread environmental problems such as flooding, deforestation, poor sanitation, and urban sprawl (Ali, & Rahman, 2024). Despite the existence of policies advocating for environmental and sustainability education, implementation at the tertiary level has been inconsistent and largely ineffective. While a few universities, such as the University of Ibadan and Covenant University, have initiated sustainability-focused programs, most institutions still operate with curricula that lack adequate integration of urban sustainability themes (Bahreldin et al., 2024). The need for a structured approach to embedding sustainability education in Nigerian higher institutions remains urgent.

In Calabar Metropolis, home to the University of Calabar (UNICAL) and the Cross River University of Technology (CRUTECH), urban sustainability challenges are becoming increasingly pronounced. Issues such as improper waste management, encroachment on green spaces, and the vulnerability of infrastructure to climate change impacts pose significant threats to the city's sustainable future (Kumar, et al., 2023). However, sustainability education has not yet been effectively mainstreamed across academic programs

in these institutions. Empowering students with sustainability competencies relevant to the local context and aligned with global development goals is imperative. Investigating the challenges and opportunities in integrating urban sustainability education in Calabar's tertiary institutions is therefore a necessary step toward producing environmentally responsible graduates and promoting sustainable urban development.

Statement of the Research Problem

Nigeria is currently grappling with the adverse effects of rapid urbanization, environmental degradation, and poor urban planning, which threaten the long-term sustainability of its cities (Kodiya, et al., 2025). Urban centers such as Lagos, Port Harcourt, Abuja, and Kano are experiencing severe challenges including traffic congestion, waste mismanagement, loss of biodiversity, flooding, and slum proliferation, largely due to inadequate integration of sustainability principles in urban development practices (Unegbua et al., 2024). These problems are further exacerbated by the disconnect between urban policy frameworks and the educational system, especially in tertiary institutions where future professionals are trained. The absence of well-structured urban sustainability education in higher institutions raises concerns about the capacity of graduates to proffer sustainable solutions to Nigeria's urban crisis.

While some studies in other Nigerian states have explored environmental education and sustainable development in tertiary institutions—for instance, in Ogun State (Abenu, Yusufu, & Ugochukwu, 2024), Oyo State (Amin, Abdullahi, & Bamidele, 2024), and Abuja (Ekwesaranna, et al., 2024), many of these studies remain general in approach and do not specifically focus on the integration of urban sustainability into institutional curricula. Internationally, countries like Sweden, Germany, and South Africa have documented significant efforts in embedding sustainability into their higher education curricula (O'Donoghue, & Rosenberg, (2024); Nyika, (2024). However, few studies have domesticated these concepts to the peculiar urban and educational landscape of Calabar Metropolis. As a result, there is limited empirical evidence on how urban sustainability education is being addressed in tertiary institutions like the University of Calabar (UNICAL) and the Cross River University of Technology (CRUTECH), creating a critical knowledge gap in local sustainability education efforts.

This paucity of locally relevant data hinders the development of effective strategies for integrating urban sustainability into higher education in Calabar, a city that is increasingly susceptible to flooding, waste accumulation, and urban sprawl (Salifu, Eziashi, & Dabi, 2024). Without clear insights into the challenges and opportunities for embedding

sustainability education in these institutions, policymakers and academic planners are left without direction in implementing sustainable reforms. Therefore, this study seeks to fill this gap by critically examining how urban sustainability education can be integrated into the curricula of tertiary institutions in Calabar Metropolis. The research aims to highlight both the obstacles and potential strategies for embedding such education, ultimately contributing to the development of a more environmentally conscious and sustainability-driven academic culture in Calabar Metropolis.

Aim and objectives of the study

The aim of this study is to examine the integration of urban sustainability education into the curricula of tertiary institutions in Calabar Metropolis, with a focus on identifying the challenges and opportunities associated with such integration. While the objectives included to;

1. Identify the key challenges hindering the integration of urban sustainability education into the curricula of tertiary institutions in Calabar Metropolis.
2. Explore the opportunities and potential strategies for promoting urban sustainability education in the University of Calabar (UNICAL) and the Cross River University of Technology (CRUTECH).

Hypothetical statement

This study hypothesized that there is a significant relationship between the challenges faced by tertiary institutions and the level of integration of urban sustainability education into the curricula of the University of Calabar (UNICAL) and the Cross River University of Technology (CRUTECH)

Literature review

Key challenges hindering the integration of urban sustainability education into the curricula of tertiary institutions

In developed countries, the integration of urban sustainability education into higher education curricula has been widely advocated, but several challenges still persist. In a study conducted by Angelaki, Bersimis, Karvounidis, & Douligeris, (2024), it was observed that despite growing awareness of environmental issues, many universities in Europe and North America lack a coherent institutional strategy for embedding sustainability across disciplines. Similarly, Ajani, & Govender, (2025), noted that resistance to change, lack of trained personnel, and limited interdisciplinary collaboration are major obstacles hindering effective curriculum reform for sustainability education. In another study, Murray, & Wright, (2024), emphasized the dominance of traditional pedagogical models and the reluctance of faculty

members to adopt new sustainability-focused teaching methods as significant barriers in Canadian universities.

In Africa, tertiary institutions face even more complex challenges in integrating sustainability into their academic frameworks. In a related study, Molekwa, (2024), revealed that infrastructural deficits, lack of policy support, and insufficient funding are the major hindrances in most African universities. Similarly, in South Africa, a study by Singun, (2025), highlighted that while there is growing interest in sustainability education, implementation is slowed by fragmented educational policies and limited institutional capacity. In East Africa, Syed, Aina, & Yigitcanlar, (2024), found that urban sustainability is often perceived as a niche subject, and is not prioritized in mainstream curricula due to competing national development priorities and low public awareness.

In Nigeria, the situation mirrors the broader African context, but with regional peculiarities. In a study conducted by Abenu, Yusufu, & Ugochukwu, (2024), it was found that most Nigerian tertiary institutions, including those in Lagos, Enugu, and Kano, lack the curricular structures and institutional commitment to support sustainability education. Similarly, Mncube, et al., (2023), reported that inadequate funding, poor curriculum review mechanisms, and limited stakeholder involvement are key constraints. However, few studies have focused specifically on tertiary institutions in Calabar Metropolis such as the University of Calabar (UNICAL) and the Cross River University of Technology (CRUTECH).

Opportunities and potential strategies for promoting urban sustainability education

In many African tertiary institutions, growing awareness of global environmental challenges has opened up new opportunities for promoting urban sustainability education. In a study conducted by Amoros Molina et al. (2023), it was observed that increased access to international collaborations, such as through the United Nations' Sustainable Development Goals (SDGs), has provided a framework for integrating sustainability principles into higher education. Similarly, Blom, & Karrow, (2024), noted that African universities participating in global environmental education networks are increasingly incorporating sustainability themes into research and teaching, particularly in urban planning and environmental science programmes. These collaborations help universities adopt best practices and adapt global models to local urban contexts.

In Nigeria, a number of tertiary institutions are gradually making efforts to embrace sustainability education by leveraging local partnerships and policy reforms. For instance, in a study by Seedat-Khan, et al., (2023), institutions in states like Lagos, Ogun, and Rivers

have introduced urban sustainability modules in their environmental management and urban planning courses. Similarly, Izuchukwu Precious, & Zino, (2025), reported that some Nigerian universities are tapping into funding opportunities provided by international donors and environmental NGOs to develop sustainability-focused curricula and to organize awareness programmes that target both students and the surrounding communities. These initiatives have contributed to building the foundation for a culture of sustainability in tertiary education, especially in urban areas.

In addition to partnerships and curriculum development, several strategies have been identified to further promote urban sustainability education in Nigerian and African tertiary institutions. In a related study, Mittal, & Bansal, (2024), suggested the inclusion of experiential learning, community-based projects, and sustainability-focused internships as key strategies for reinforcing practical knowledge and student engagement. Furthermore, integrating sustainability into institutional mission statements and long-term strategic plans can ensure consistency in teaching and implementation (Sanches, et al., 2023). These strategies, if adequately implemented and supported by institutional leadership and national education policies, could enhance the impact of sustainability education and help cultivate future urban planners and environmental stewards across Africa.

Methodology

This study adopted a descriptive survey research design, which is suitable for gathering information from a population to describe existing conditions regarding the integration of urban sustainability education in tertiary institutions. Both primary and secondary sources of data were utilized. Primary data were collected through the administration of structured questionnaires, while secondary data were sourced from academic journals, institutional reports, and policy documents. The sample size comprised 200 respondents, drawn from academic staff, administrative personnel, and final-year students of the University of Calabar (UNICAL) and Cross River University of Technology (CRUTECH). A stratified random sampling technique was employed to ensure fair representation across departments and faculties in both institutions. The collected data were analyzed using descriptive statistics such as frequency tables and percentages, while inferential statistics including chi-square tests were used to test the formulated hypothesis.

Result and discussion

The data from Table 1, indicates that final-year students constituted the largest segment of respondents, totaling 100 participants, while academic staff and administrative staff accounted for 55 and 45 respondents respectively. This distribution highlights the importance

of incorporating student perspectives into the evaluation process, given that they are the direct recipients and ultimate beneficiaries of curriculum reforms and institutional improvements. The equal representation of students from both the University of Calabar (UNICAL) and Cross River University of Technology (CRUTECH) ensures a fair and balanced view of student experiences across both institutions, thereby strengthening the credibility of the findings. The active involvement of academic and administrative staff also enriches the study, offering a comprehensive understanding of institutional dynamics from multiple viewpoints. These findings resonate with the conclusions of Abo-Khalil (2024), who emphasized the critical role of student engagement and stakeholder inclusion in driving the successful integration of sustainability and innovation within higher education systems globally.

Table 1: Respondents' Category

Category	UNICAL	CRUTECH	Total
Academic Staff	30	25	55
Administrative Staff	20	25	45
Final-Year Students	50	50	100

Source: Researcher’s fieldwork, 2025

The findings from the descriptive analysis of Table 2, indicate that while a significant number of respondents—70 individuals—reported being very aware, and 75 were somewhat aware of urban sustainability education, a concerning 55 respondents admitted to having no awareness at all, underscoring a substantial gap in knowledge dissemination and exposure to sustainability concepts, particularly within CRUTECH. This disparity in awareness levels suggests that despite growing global discourse on urban sustainability, local implementation and educational integration remain inconsistent and insufficient. The presence of a sizeable uninformed population points to the urgent need for well-structured sensitization initiatives and targeted educational campaigns, especially in institutions lagging behind. This inference aligns with the study by Fan and Fan (2024), which emphasizes the pivotal role of education and awareness programs in shaping energy conservation behaviors and promoting urban sustainability. Their work supports the assertion that informed individuals are more likely to engage in sustainable practices, thus reinforcing the necessity for deeper institutional efforts to embed sustainability education across curricula.

Table 2: Awareness of Urban Sustainability Education

Awareness Level	UNICAL	CRUTECH	Total
Very Aware	40	30	70
Somewhat Aware	35	40	75
Not Aware	25	30	55

Source: Researcher’s fieldwork, 2025

The analysis from Table 3 clearly reveals that the lack of trained personnel stands out as the most critical challenge, cited by 85 respondents, closely followed by an inadequate curriculum framework (65 mentions) and poor institutional support (50 mentions). These results underscore a systemic weakness in both human capacity and structural design needed for effective sustainability education, indicating a pressing need for strategic investment in continuous professional development, capacity building, and comprehensive curriculum reform. Interestingly, the data further shows that respondents from CRUTECH expressed a slightly greater concern regarding institutional support compared to their UNICAL counterparts, suggesting a variation in administrative commitment and resource availability between the institutions. This situation implies that any successful reform must be context-sensitive and institution-specific. The findings resonate with the study by Fasinro, Akinkuotu, and Aina (2024), which emphasized the persistent challenges in curriculum implementation and advocated for the revitalization of Education Resource Centres as a means of supporting effective educational delivery. Hence, this study reinforces the view that the absence of skilled personnel and institutional willpower continues to frustrate efforts toward effective educational transformation in Nigeria’s tertiary institutions.

Table 3: Perceived Challenges to Integration

Challenges	UNICAL	CRUTECH	Total
Lack of Trained Personnel	45	40	85
Inadequate Curriculum Framework	35	30	65
Poor Institutional Support	20	30	50

Source: Researcher’s fieldwork, 2025

The findings from Table 4, reveal that policy inclusion was overwhelmingly identified by respondents (85 mentions) as the most effective strategy for enhancing urban sustainability education, followed by capacity-building workshops (65 mentions) and public awareness campaigns (50 mentions). This prioritization underscores a broad consensus on the need for formal, institutionalized support mechanisms to embed sustainability principles within

educational systems. The emphasis on policy inclusion suggests that stakeholders recognize the critical role of legislative and administrative frameworks in driving sustainable practices and ensuring long-term impact. Furthermore, the equal representation of public awareness campaigns across both institutions UNICAL and CRUTECH reflects a shared acknowledgment of the power of information dissemination and community engagement in fostering behavioral change and environmental consciousness. These findings align with Owadara's (2025) study, which emphasized the significance of participatory and inclusive strategies in transforming educational environments, particularly through structured policy and stakeholder involvement. Therefore, this study reinforces the assertion that strategic policy support, capacity development, and awareness efforts must work hand-in-hand to promote inclusive and effective urban sustainability education.

Table 4: Recommended Strategies for Promotion

Strategies	UNICAL	CRUTECH	Total
Capacity Building Workshops	35	30	65
Policy Inclusion	40	45	85
Public Awareness Campaigns	25	25	50

Source: Researcher's fieldwork, 2025

Test of hypothesis

H₀: There is no significant relationship between the challenges faced by tertiary institutions and the level of integration of urban sustainability education into the curricula of the University of Calabar (UNICAL) and the Cross River University of Technology (CRUTECH).

H₀₁: There is a significant relationship between the challenges faced by tertiary institutions and the level of integration of urban sustainability education into the curricula of the University of Calabar (UNICAL) and the Cross River University of Technology (CRUTECH).

The Chi Square test of Independence was employed to test this hypothesis.

Tables 5 and 6 shows the number of students from UNICAL and CRUTECH who reported different challenges in integrating urban sustainability education. For example, 45 students from UNICAL and 40 from CRUTECH said that a lack of trained personnel is a major challenge. These numbers were then compared (observed) with what we would expect if there were no real difference between the two universities (expected frequencies). A statistical test (Chi-square) was used to compare them, giving a value of 2.68 and a p-value

of 0.262. Since this p-value is more than 0.05, it means that any differences we see in the table could not just be due to chance and are not statistically significant.

Tables 7 and 8 presented the awareness levels of students from both universities about urban sustainability education. Again, actual responses were compared (e.g., 40 UNICAL students are “Very Aware”) with the expected numbers if awareness was similar in both schools. The Chi-square value here is 2.22, and the p-value is 0.330, which is also more than 0.05. This again means there's no strong evidence that awareness levels are different between the two universities. Since both p-values are above 0.05, the idea was accepted, rejecting the null hypothesis that there is no significant relationship between the challenges or awareness levels and the level of integration in these two institutions.

Table 5: Observed Frequencies (Challenges)

Challenge	UNICAL	CRUTECH
Lack of Trained Personnel	45	40
Inadequate Curriculum Framework	35	30
Poor Institutional Support	20	30

Table 6: Expected Frequencies (Challenges)

Challenge	UNICAL	CRUTECH
Lack of Trained Personnel	42.5	42.5
Inadequate Curriculum Framework	32.5	32.5
Poor Institutional Support	25.0	25.0

- **Chi-Square Value (χ^2):** 2.68
- **p-value:** 0.262

Table 7: Observed Frequencies (Awareness)

Awareness Level	UNICAL	CRUTECH
Very Aware	40	30
Somewhat Aware	35	40
Not Aware	25	30

Table 8: Expected Frequencies (Awareness)

Awareness Level	UNICAL	CRUTECH
Very Aware	35.0	35.0
Somewhat Aware	37.5	37.5
Not Aware	27.5	27.5

- **Chi-Square Value (χ^2):** 2.22
- **p-value:** 0.330

Conclusion

Based on the findings of this study, it is evident that while there is a growing awareness of urban sustainability education among stakeholders in tertiary institutions within Calabar Metropolis, several critical challenges hinder its effective integration into the academic curricula. These challenges include a lack of trained personnel, inadequate curriculum frameworks, and poor institutional support, particularly in CRUTECH and to a lesser extent in UNICAL. However, the study also identified significant opportunities, such as the potential for policy inclusion, capacity-building workshops, and awareness campaigns, which can serve as strategic entry points for promoting sustainability education. Therefore, the integration of urban sustainability education in Calabar's tertiary institutions remains a viable and necessary initiative, requiring a collaborative approach involving institutional leadership, government policy makers, and academic stakeholders to ensure long-term environmental, social, and economic development.

Recommendations

Based on the study findings, the following recommendations were reached;

- The National Universities Commission (NUC) and relevant academic boards should revise existing curricula to include urban sustainability education as a core component across disciplines in tertiary institutions within Calabar Metropolis.
- Universities such as UNICAL and CRUTECH should organize regular training, workshops, and seminars for academic staff to equip them with the necessary knowledge and teaching methodologies related to sustainability education.
- The Cross River State Government, in partnership with educational stakeholders and NGOs, should invest in providing teaching aids, research grants, and sustainable infrastructure to support the practical implementation of sustainability education.

iv. Tertiary institutions should initiate student-led sustainability campaigns and community-based projects to promote urban sustainability awareness, thereby creating a culture of environmental responsibility among students and residents.

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