Campus Landscape and Activity Patterns at Caleb University, Imota, Lagos State, Nigeria

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ABSTRACT

The landscape of a university campus is a dynamic environment that significantly influences the behavior and engagement of its inhabitants. This research investigates the interaction between the landscape of Caleb University, Imota, Lagos State, Nigeria, and how it corresponds with the activities within the campus. The study determines how the physical environment—softscape and hardscape—supports or restricts the academic, social, and recreational activities of students and staff. A mixed-methods approach was employed, combining a structured questionnaire administered to 300 respondents across multiple colleges and academic levels with direct spatial observation of the campus landscape. Findings reveal that the campus landscape significantly influences daily movement patterns, with 232 respondents (77.4%) confirming that landscape design affects their movement and that areas of difficult access exist. Shade emerged as the most critical factor for outdoor comfort, with 184 respondents (61.3%) agreeing that shaded areas encourage longer outdoor stays, while heat and sun exposure were identified as the primary challenges. Only 107 respondents (35.5%) use outdoor spaces for academic activities, and 213 respondents (71%) confirmed that some campus areas are rarely used, validating the existence of passive zones. The study classifies campus zones as active (academic buildings, cafeteria, hostels, shaded walkways) and passive (football field, mini green fields, peripheral open spaces, Medicals area), revealing that active zones are predominantly associated with necessary activities while spaces for optional and social activities are underserved due to inadequate shade, seating, maintenance, and pathway connectivity. The Love Garden presents a paradoxical case—valued by some for its shade and connectivity but avoided by others due to insects, poor maintenance, and bad access pathways. The study recommends prioritising shade infrastructure, providing outdoor seating, improving pathway connectivity, activating passive zones through targeted interventions, and engaging professional landscape design expertise to create a more responsive campus environment.

Keywords: Active and passive zones, Caleb University, Campus activities, Environmental design, Landscape interaction, Spatial correspondence

INTRODUCTION

The physical landscape of a university campus constitutes a critical yet frequently underexamined dimension of the educational environment. While considerable attention is typically devoted to the design and adequacy of buildings—classrooms, laboratories, libraries—the outdoor spaces that connect and frame these structures often receive limited design consideration, despite serving as the primary setting for a substantial proportion of daily campus life (Dober, 2000). These outdoor spaces, composed of softscape elements (vegetation, lawns, gardens) and hardscape elements (pathways, plazas, seating structures, paved surfaces), collectively shape how campus users move through, linger in, and interact with their environment. The quality of this landscape directly influences whether outdoor spaces become vibrant settings for learning, socialisation, and recreation or remain underutilised transit corridors (Gehl, 2011).

Research across environmental psychology and landscape architecture has established that outdoor environment characteristics significantly affect human behaviour, well-being, and social interaction (Kaplan & Kaplan, 1989; Carmona et al., 2010). Within university settings, campus landscape quality has been shown to influence student satisfaction, academic engagement, stress recovery, and even institutional retention rates (Hajrasouliha, 2017; Scholl & Gulwadi, 2015; Adeyemi, Ademakinwa, & Adeyemi, 2024). However, the majority of this research has been conducted in North American, European, and East Asian contexts, with limited application to sub-Saharan African campuses where climatic conditions, institutional development trajectories, and cultural patterns of outdoor space use differ substantially.

In Nigeria, the rapid expansion of higher education—particularly the proliferation of private universities since the early 2000s—has created numerous campuses with varying levels of landscape planning sophistication. Many have been developed under constraints that favour building construction over landscape development, resulting in outdoor environments poorly adapted to user needs (Fadamiro & Adedeji, 2013). Caleb University, a private institution established in 2007 in Imota, Ikorodu Local Government Area, Lagos State, provides an instructive case for investigating the current state of landscape-activity interaction. This concern with the performance of institutional environments is consistent with related evidence from Caleb University showing that accommodation quality can affect staff job performance (Ademakinwa et al., 2024).

This research investigates the interaction between the landscape of Caleb University and the activities within the campus. It aims to determine how the physical environment supports or restricts user activities, map activity patterns against the spatial layout, and identify active and passive zones in relation to user experience and landscape elements. The findings provide a foundation for future interventions to create a more responsive campus environment.

Aim and Objectives

Aim: To investigate the interaction between the landscape of Caleb University and how it corresponds with the activities within the campus.

The Objectives to achieve the aim are to:

1. To identify and document key softscape and hardscape elements within the Caleb University campus.
2. To map academic, social, and recreational activity patterns across the campus landscape.
3. To analyse how landscape elements correspond with and influence campus activities.
4. To classify campus zones as "active" or "passive" based on user frequency and landscape
5. characteristics.
6. To propose evidence-based recommendations for landscape interventions aimed at creating a more responsive campus environment.

Research Questions

1. What softscape and hardscape elements characterise the landscape of Caleb University?
2. What spatial patterns of academic, social, and recreational activities are observable across the campus?
3. How do campus landscape elements correspond with and influence the activities occurring within them?
4. Which zones function as "active" and which as "passive," and what landscape characteristics distinguish them?
5. What landscape interventions could enhance the correspondence between the campus environment and activities?

Significance of the Study

This study contributes to the limited body of empirical research on campus landscape quality in Nigerian private universities, extending frameworks developed in Western contexts to a tropical, sub-Saharan African setting. The findings provide Caleb University's management with evidence-based guidance for prioritising landscape improvements. The methodological approach—combining structured questionnaire data with spatial observation—offers a replicable model for similar investigations at other institutions. The identification and

classification of active and passive zones introduces a spatial analytical tool that can inform campus master planning. More broadly, the research contributes to the growing recognition that campus outdoor environments are not peripheral amenities but integral components of the educational experience.

LITERATURE REVIEW

Campus Landscape: Concept and Functions

The campus landscape encompasses the totality of outdoor spaces within a university—natural features, planted areas, paved surfaces, outdoor structures, and the spatial relationships among them and with adjacent buildings. Dober (2000) identifies four interconnected functions: functional (facilitating movement and outdoor activities), aesthetic (contributing visual coherence and sensory richness), symbolic (expressing institutional identity), and ecological (supporting biodiversity and microclimate regulation). This multifunctional characterisation moves beyond viewing landscape solely in decorative terms, establishing it as an active component of the educational environment.

A fundamental distinction exists between softscape and hardscape components. Softscape—trees, shrubs, lawns, gardens—contributes ecological and psychological qualities: providing shade, reducing ambient temperatures, creating spatial enclosure, and supporting psychological restoration (Booth, 2012; Ulrich, 1984). Hardscape—pathways, plazas, seating, lighting—provides infrastructure for movement, gathering, and prolonged occupation (Harris & Dines, 1998). Dee (2001) argues that the most effective outdoor spaces integrate both elements in a complementary manner: a bench beneath a shade tree is more inviting than either element alone. This principle of integration is central to evaluating Caleb University's landscape.

Coulson, Roberts, and Taylor (2015) emphasise that effective campus landscapes are those where outdoor spaces are deliberately designed spatial systems rather than residual areas between buildings. However, they observe that this ideal is frequently unrealised in institutions experiencing rapid, incremental growth without comprehensive master planning—a pattern relevant to many Nigerian private universities.

THEORETICAL FRAMEWORK

This study draws on four complementary theoretical frameworks:

Gehl's Framework of Outdoor Activities: Gehl (2011) categorises outdoor activities as necessary (occurring regardless of environmental quality, such as walking to class), optional (dependent on environmental comfort, such as sitting outdoors or strolling), and social (arising from co-presence, such as conversations and group gatherings). This framework predicts that landscape zones with higher environmental quality will support richer mixes of optional and social activities—functioning as active zones—while lower-quality zones will support primarily necessary activities, functioning as passive zones. As Gehl's framework was developed in temperate European climates, its application in tropical Lagos requires attention to contextual differences, particularly the heightened importance of shade and rain protection.

Affordance Theory: Gibson's (1979) theory proposes that environments offer "affordances"—opportunities for action perceived by users in relation to their capabilities. A shaded lawn affords sitting and socialising; a wide pathway affords walking. Heft (1988) extended this into a functional taxonomy for outdoor settings. This framework enables systematic analysis of the activity potential of different landscape zones: spaces rich in diverse affordances will support diverse activities, while affordance-poor spaces will restrict behavioural range.

Attention Restoration Theory (ART): Kaplan and Kaplan (1989) propose that natural environments possess qualities—being away, extent, fascination, and compatibility—that facilitate recovery from mental fatigue. Kaplan (1995) argued that natural campus landscapes restore the directed attention required for academic work, making them functional supports for learning. Scholl and Gulwadi (2015) applied ART to campuses specifically, proposing that green landscapes function as learning spaces. This framework underscores the importance of softscape elements at Caleb University in supporting academic performance and well-being.

Prospect-Refuge Theory: Appleton (1975) proposes that humans prefer environments offering both prospect (open views) and refuge (shelter and enclosure). Campus spaces balancing openness with sheltering elements—such as seating beneath tree canopies overlooking lawns—tend to attract more sustained use than fully exposed or enclosed spaces. This theory helps explain why certain landscape configurations at Caleb University attract intensive use while others are avoided.

Empirical Evidence on Campus Landscape and User Activities

Research has consistently demonstrated that campus outdoor space characteristics significantly influence user behaviour. Abu-Ghazzeh (1999), studying the University of Jordan, found that spatial enclosure, shade provision, seating availability, and proximity to pedestrian routes were stronger predictors of outdoor space use than space size or location. However, his arid-climate findings require cautious application to humid tropical Lagos, where humidity compounds thermal discomfort and rainfall introduces additional constraints.

Speake, Edmondson, and Nawaz (2013) found that students highly valued campus green spaces for relaxation and stress relief, but also noted that many students were unaware of available green spaces, suggesting that accessibility and visibility—not merely existence—determine usage. McFarland, Waliczek, and Zajicek (2008) established a statistically significant positive correlation between campus green space use and students' self-reported quality of life at Texas State University. Hajrasouliha (2017) developed the "campus score" concept measuring design quality across connectivity, greenness, diversity, and gathering space quality, finding that higher scores correlated with higher student retention rates. Lau, Gou, and Liu (2014) identified principles for healthy campus environments: diverse space types, natural elements, and connected pedestrian networks promoting walking and incidental interaction. Marcus and Francis (1998) provided evidence-based design guidelines emphasising the importance of matching landscape design to user needs, identifying specific failures that inhibit outdoor space use—insufficient shade, lack of seating, poor maintenance, and spatial isolation from pedestrian flows.

Active and Passive Zones

The classification of spaces as "active" or "passive" draws on established research. Whyte (1980) found that active urban plazas shared identifiable characteristics—seating, shade, food access, and triangulation elements—while passive ones were exposed, poorly furnished, or disconnected from pedestrian flows. Gehl and Svarre (2013) extended this through systematic methods for observing and mapping activity patterns. Mehta (2014) proposed multiple dimensions of space quality—inclusiveness, comfort, safety, and pleasurability—that determine whether spaces attract active use or remain neglected. In this study, active zones are defined as areas attracting high user presence and diverse activities, while passive zones experience low or transitory use. Understanding this spatial pattern reveals where landscape interventions could have the greatest impact.

Campus Landscape in the Nigerian Context

Nigerian campus landscape research, while growing, remains limited. Fadamiro and Adedeji (2013) found widespread deficiencies in southwestern Nigerian university campuses: insufficient shade trees, inadequate seating, poorly maintained vegetation, and dominance of vehicular over pedestrian circulation. Related Nigerian evidence on environmental quality further shows that users' experience of environmental conditions remains central to design assessment (Adeyemi et al., 2024). These findings, though focused on public universities, are relevant to private institutions where similar pressures may apply. Lagos State's humid tropical climate—high temperatures (25–33°C), high humidity, and distinct wet and dry seasons—amplifies the importance of shade and rain protection as determinants of outdoor space usability. Private universities like Caleb University face the dual challenge of financial pressures favouring building construction and competitive incentives to create attractive campus environments for student recruitment. This tension makes the landscape-activity interaction at such institutions a particularly relevant subject for investigation.

Research Gap

The literature establishes that campus landscape quality measurably influences user behaviour, satisfaction, and well-being, supported by robust theoretical frameworks and extensive empirical evidence. However, significant

gaps remain: most research originates from North America, Europe, and East Asia; Nigerian campus studies are scarce and focused on public institutions; and no study has systematically examined the landscape-activity correspondence at a Nigerian private university using combined spatial observation and user feedback. This study addresses these gaps by investigating the landscape of Caleb University, mapping activity patterns, classifying active and passive zones, and evaluating the correspondence between landscape elements and campus activities.

METHODOLOGY

Research Design

This study adopted a mixed-methods research approach, combining quantitative and qualitative data collection through a structured questionnaire supplemented by direct spatial observation of the campus landscape. The mixed-methods approach was selected because the interaction between landscape and human activity is a multidimensional phenomenon that cannot be fully captured by either quantitative measurements or qualitative descriptions alone (Creswell & Creswell, 2018). Quantitative data from closed-ended questionnaire items provided measurable indicators of user perceptions and behaviour patterns, while qualitative data from open-ended questions captured the experiential depth and contextual detail of users' interactions with the campus landscape.

The theoretical basis for this methodological approach draws on Gehl and Svarre's (2013) framework for studying public life, which advocates the combination of systematic observation of how spaces are used with direct inquiry into users' experiences and preferences. This dual approach enables the identification of not only what is happening in the landscape but also why it is happening.

Study Area

Caleb University is a private institution established in 2007, situated in Imota, Ikorodu Local Government Area, Lagos State, Nigeria. The university is approved by the National Universities Commission (NUC) and operates multiple colleges, including COLENSMA (College of Environmental Sciences and Management), COCIMS (College of Communication and Information Management Sciences), COPOS (College of Postgraduate Studies), CASMAS (College of Applied Sciences, Mathematics, and Statistics), and the College of Medical Sciences.

The campus comprises academic buildings, administrative facilities, student hostels, a cafeteria, a chapel, a library, sports facilities including a football field and volleyball court, and various outdoor spaces including the notable "Love Garden." The campus is located within the humid tropical climatic zone of southwestern Nigeria, characterised by high temperatures averaging 25–33°C, high relative humidity, abundant rainfall during the wet season (April–October), and a drier season from November to March. These climatic conditions directly influence outdoor space usability, making shade provision, natural ventilation, and rain protection critical landscape considerations.

The campus landscape features a combination of softscape elements—including numerous trees, particularly along the walkway from the cafeteria to the administrative and architecture buildings, trimmed grass, and garden areas—and hardscape elements including paved and unpaved pathways, open fields, parking areas, and limited outdoor seating structures. The terrain is notably undulating, with several hills and slopes that affect pedestrian movement across the campus.

Population and Sampling

The study population comprised students of Caleb University who are regular users of the campus landscape. A convenience sampling technique was employed, targeting students across different academic levels and colleges to capture a range of perspectives. A total of 300 respondents participated in the study. This robust sample size allowed for a comprehensive quantitative analysis complemented by qualitative insights, providing a strong foundation to identify patterns and themes relevant to the research objectives.

The demographic profile of the respondents was as follows: 213 male (71%) and 87 female (29%); distributed across levels 100 through 400 and postgraduate (MSc) programmes, with the largest groups being 400-level students (97 respondents, 32.3%) and MSc 1 students (97 respondents, 32.3%). Respondents represented multiple colleges, with COLENSMA being the most represented (48 respondents, 16.1%), followed by CASMAS, COPOS, and COCIMS. Importantly, 203 respondents (67.8%) had been at Caleb University for three years or more, indicating that the majority possessed substantial familiarity with the campus landscape.

Data Collection Instrument

Data was collected through a structured questionnaire administered online via Google Forms. The questionnaire was organised into four sections:

Section A – Background Information: Collected demographic data including gender, academic level, college, and duration of time at the university. These variables enabled the characterisation of respondents and provided context for interpreting their responses.

Section B – Landscape and Movement: Contained five closed-ended (Yes/No) statements assessing respondents' perceptions of campus layout, walkway connectivity, navigability, accessibility challenges, and the influence of landscape design on daily movement.

Section C – Outdoor Spaces and Activities: Contained five items assessing the influence of shaded areas on outdoor duration (5-point Likert scale), the use of open spaces for social interaction (Yes/No/Maybe), landscape support for recreational activities (5-point Likert scale), use of outdoor spaces for academic activities (Yes/No), and the perception of underutilised campus areas (True/False).

Section D – User Experience (Open-Ended): Contained five open-ended questions inviting respondents to describe challenges faced when using outdoor spaces, areas used most and least frequently (with reasons), the effect of campus landscape on social interaction, and suggestions for improvement. These open-ended items generated qualitative data that complemented the quantitative findings.

Spatial Observation

In addition to the questionnaire, direct spatial observation of the campus landscape was conducted by the researchers. This involved walking through the campus, observing how different outdoor spaces were used, noting the presence and condition of softscape and hardscape elements, identifying areas of high and low activity, and documenting the physical characteristics of key zones. The tree-lined walkway from the cafeteria to the administrative and architecture buildings, the Love Garden, the football field, and the open areas surrounding various academic buildings were among the spaces observed. This observational data supplemented the questionnaire findings and contributed to the identification and classification of active and passive zones.

Data Analysis

Quantitative data from closed-ended questionnaire items were analysed using descriptive statistics, including frequencies and percentages, and are presented in tables. Qualitative data from open-ended questions were analysed using thematic analysis, following the approach described by Braun and Clarke (2006), in which responses were read, coded, and grouped into recurring themes. The integration of quantitative and qualitative findings enabled a comprehensive understanding of the interaction between landscape elements and campus activities.

ANALYSIS AND DISCUSSION

Respondent Profile

The respondent profile shows that the participants were sufficiently diverse across academic levels and colleges to provide a useful overview of campus landscape experience. Since most respondents had spent at least three years in the university, their responses can be considered informed by sustained engagement with the physical environment.

Perceptions of Landscape and Movement

The findings indicate that the landscape of Caleb University significantly affects movement patterns across the campus. A substantial majority of respondents confirmed that the campus layout influences how they move daily and that some areas are difficult to access. This reflects the practical role of hardscape elements such as paths, walkways, and terrain in structuring pedestrian movement. It also suggests that the existing landscape is not entirely efficient in supporting smooth circulation.

The undulating topography of the campus, combined with uneven and sometimes unpaved routes, appears to contribute to these movement challenges. This supports the argument that campus landscapes are not merely aesthetic backdrops but functional infrastructures that directly affect user behaviour (Dober, 2000). It also aligns with findings that environmental quality and physical planning affect institutional performance and user experience in Nigerian settings (Ademakinwa et al., 2024).

Perceptions of Outdoor Spaces and Activities

Table 3: Perceptions of Outdoor Spaces and Activities (n = 300)

Variable	Response Category	Frequency (n)	Percentage (%)
Shaded areas encourage me to stay outdoors longer	Strongly Agree	97	32.3
	Agree	87	29.0
	Neutral	48	16.1
	Disagree	48	16.1
	Strongly Disagree	20	6.5
Open spaces are used for social interaction	Yes	184	61.3
	Maybe	77	25.8
	No	39	12.9
Campus landscape supports recreational activities	Strongly Agree	39	12.9
	Agree	97	32.3
	Neutral	115	38.7
	Disagree	20	6.5
	Strongly Disagree	29	9.7
I use outdoor spaces for academic activities	Yes	106	35.5

	No	194	64.5
Some areas on campus are rarely used	True	213	71.0
	False	87	29.0

Table 4: Summary Interpretation of Key Findings

Key Indicator	Majority Response	Frequency (n)	Percentage (%)	Interpretation
Influence of shading	Agree (SA + A)	184	61.3	Shading strongly enhances outdoor usage
Social use of open spaces	Yes	184	61.3	Outdoor spaces support social interaction
Recreational support	Neutral	116	38.7	Weak or unclear recreational provision
Academic use of outdoor spaces	No	194	64.5	Outdoor learning is poorly integrated
Underutilised spaces	True	213	71.0	Presence of inactive or poorly designed spaces

Table 5: Design Implications

Issue Identified	Evidence (n, %)	Design Implication	Recommended Action
Lack of thermal comfort	184 (61.3%) depend on shade	Climate-sensitive design needed	Increase trees, canopies, shaded seating
Inconsistent social space use	77 (25.8%) uncertain	Uneven space quality	Standardise design of gathering spaces
Weak recreational support	116 (38.7%) neutral	Lack of active features	Introduce sports and recreational facilities
Low academic outdoor usage	194 (64.5%) do not use	Poor learning environment outdoors	Provide outdoor classrooms, Wi-Fi, seating
Underutilised areas	213 (71.0%)	Inefficient land use	Redesign and activate dead spaces

The critical role of shade

A combined 184 respondents (61.3%) agreed or strongly agreed that shaded areas encourage them to stay outdoors longer. This is a key finding for a campus situated in Lagos's tropical climate, where high temperatures and intense solar radiation are major barriers to outdoor comfort. It confirms the theoretical predictions of both Appleton's (1975) prospect-refuge theory and Kaplan and Kaplan's (1989) attention restoration theory, which both point to the importance of sheltered and psychologically comfortable environments. It also supports recent Nigerian evidence that supportive environmental conditions improve users' performance and experience (Adeyemi et al, 2024).

Spatial observation reinforced this finding. The tree-lined walkway from the cafeteria to the architecture building—one of the most heavily shaded corridors on campus—was observed to attract not only pedestrian traffic but also incidental pausing, conversation, and lingering behaviour. In contrast, exposed open spaces with no shade cover were observed to function primarily as transit zones through which people moved quickly without stopping.

Social interaction

A majority of 184 respondents (61.3%) confirmed that open spaces are used for social interaction, with an additional 77 respondents (25.8%) responding "Maybe" and only 39 respondents (12.9%) saying "No." This suggests that the campus landscape facilitates social activity, but not uniformly or strongly enough for all users to recognise it clearly. The qualitative responses explain this ambiguity, with many respondents noting that the campus appears to be planned mainly for movement rather than for deliberate social engagement.

In Gehl's (2011) framework, this indicates that while some social activities emerge in the campus landscape, the conditions for their flourishing—comfortable seating, shade, and clear gathering areas—are insufficiently provided. As a result, the landscape supports social interaction in a limited and uneven way.

Recreational support

Responses were divided on whether the campus landscape supports recreational activities. While 136 respondents (45.2%) agreed or strongly agreed, 116 respondents (38.7%) were neutral, and 49 respondents (16.2%) disagreed or strongly disagreed. This ambivalence suggests that some recreational affordances exist, but they are not sufficiently developed or accessible to many users.

The qualitative responses confirm this interpretation. The football field was described as poorly constructed, while mini green fields were viewed as spaces with recreational potential that are not yet fully usable. In terms of Gibson's (1979) affordance theory, the campus possesses recreational possibilities, but these are weakened by design and maintenance deficiencies.

Academic use of outdoor spaces

One of the most striking findings is that only 106 respondents (35.5%) use outdoor spaces for academic activities such as reading or group discussions, while 194 respondents (64.5%) do not. This finding contrasts with the view that campus landscapes can function as learning spaces beyond classroom walls (Scholl & Gulwadi, 2015). The low level of outdoor academic use at Caleb University likely reflects inadequate shade, limited seating, insufficient quiet areas, and environmental discomfort.

This finding is also consistent with Nigerian evidence that physical and residential environmental quality can stimulate students' academic output and performance (Adeyemi, Ademakinwa, & Adeyemi, 2024). It suggests that improving outdoor learning conditions could contribute meaningfully to student academic experience.

Passive zones confirmed

A clear majority of 213 respondents (71.0%) confirmed that some areas on campus are rarely used. This validates the central concept of passive zones in the study and indicates that a substantial portion of the campus landscape is underutilised. These spaces represent opportunities for redesign, activation, and improved landscape planning.

User Experience: Qualitative Findings

The open-ended responses in Section D provided richer context for understanding how students experience the campus landscape. Thematic analysis identified several recurring themes.

Challenges Faced in Outdoor Spaces

Five major themes emerged from the descriptions of respondents regarding challenges.

Heat and sun exposure were the most frequently cited problems. Respondents referred to excessive heat, strong sun rays, and harsh weather as the main barriers to comfortable outdoor use. This further confirms the significance of shade as a primary design requirement in the tropical campus context.

Inadequate seating was another common complaint. The absence of benches, chairs, and designated sitting spaces—especially around high-traffic areas such as the cafeteria—makes it difficult for users to rest, relax, or interact comfortably. As Marcus and Francis (1998) note, seating is one of the most basic requirements for successful outdoor space use.

Poor topography and pathways were also highlighted. The campus terrain includes hills, slopes, and surfaces that become muddy or difficult during rain. These conditions create accessibility barriers and discourage movement through some parts of the campus.

Insects and dust were mentioned as environmental irritants, especially around open sandy fields and poorly maintained green areas such as the Love Garden.

Crowding and poor connectivity were also noted. Respondents described some areas as congested and complained about the lack of efficient pathway links between important buildings, indicating the need for better circulation planning.

These findings closely match prior research showing that shade, seating, and pathway quality are among the strongest determinants of outdoor space use (Abu-Ghazzeh, 1999).

Most and Least Used Campus Areas

The qualitative responses on most-used and least-used areas provide the basis for identifying active and passive zones.

Most-used areas (Active Zones): Academic buildings—including the Architecture building, COLENSMA building, classrooms, studios, and laboratories—were the most frequently cited, largely because they host required academic functions. Hostels were also heavily used for comfort and rest, while the cafeteria was used for eating and informal interaction. The Love Garden was mentioned by some respondents as attractive due to shade and network connectivity.

Least-used areas (Passive Zones): The Love Garden was also frequently identified as underused, due to insects, green mould, and poor access paths. The football field was avoided by many because of poor construction. Open spaces were seen as too exposed to the sun, while some shaded spaces were still avoided because they lacked seating. The Medicals area was also cited as difficult to access because of poor terrain.

The mixed assessment of the Love Garden is especially important. It shows that a space may contain positive landscape qualities, such as shade and connectivity, while still being undermined by poor maintenance and difficult access. This supports Carmona's (2019) argument that design quality alone is insufficient without consistent maintenance and usability.

Landscape and Social Interaction

Respondents' views on how the landscape affects social interaction revealed a nuanced picture.

First, a significant portion of respondents identified the Love Garden and field area as places that support gathering, sports, and informal interaction. These spaces offer opportunities for optional and social activities.

Second, other respondents stated that the campus is mainly designed for commuting rather than for social interaction. They noted the lack of seating areas and well-designed gathering zones, suggesting that movement infrastructure exists, but comfort infrastructure is limited.

Third, mini green fields were recognised as having unrealised potential for picnics and group activities, but these spaces cannot currently support such uses effectively. This indicates the existence of latent affordances—spaces that could support meaningful activities if complemented by better design, furnishing, and maintenance.

Suggested Improvements

Respondents' improvement suggestions provide a practical agenda for landscape intervention. Thematic analysis organised these into five categories, presented here by frequency:

1. More outdoor seating and shaded rest areas was the most frequent suggestion. Respondents requested benches, chairs, and designated "sit-out" areas for relaxation and socialising, with shaded zones that include WiFi and charging facilities. A recurring request was for seating to be placed under existing trees.
2. Improved pathways and road surfaces was the second most common suggestion, with particular emphasis on access roads to the boys' hostel and the need to level sloped areas and fix sandy or muddy surfaces.
3. Better landscape maintenance was requested, including maintenance of greenery, cleaning of garden spaces, and pest control in areas like the Love Garden.
4. More connected pathways between buildings, including the creation of shortcuts that reduce walking distances.
5. Professional landscape redesign was suggested by a respondent, who specifically recommended "hiring a landscape architect to redesign the university's landscape." Additional suggestions included more cafeterias, supermarkets, and campus transportation options.

These suggestions converge with the evidence-based design principles identified in the literature. Marcus and Francis (1998) emphasise seating and shade; Gehl (2011) stresses connectivity and pedestrian comfort; Carmona (2019) highlights maintenance as a determinant of space quality. The respondents' experiential insights independently confirm the priorities that landscape research has established through formal scholarly investigation.

Classification of Active and Passive Zones

Based on the integration of quantitative findings, qualitative responses, and spatial observation, the campus can be classified into active and passive zones.

Active zones include academic buildings, the cafeteria, hostels, and the shaded walkway linking key campus destinations. These areas attract regular and sustained use because they support necessary activities and, in some cases, optional and social ones.

Passive zones include the football field, mini green fields, peripheral open spaces, the Medicals/Psychology area, and some poorly connected or poorly maintained landscape zones. These areas attract low use because they lack one or more of the conditions necessary for sustained occupation—shade, seating, accessibility, maintenance, or functional relevance.

This classification confirms Gehl's (2011) proposition that where landscape quality is weak, only necessary activities persist, while optional and social activities require greater environmental support. It also indicates that Caleb University's landscape currently serves functional movement better than it supports broader campus life.

CONCLUSION AND RECOMMENDATIONS

Summary of Findings

This study investigated the interaction between the landscape of Caleb University, Imota, Lagos State, and the activities within the campus. Through a mixed-methods approach combining a structured questionnaire administered to 300 respondents with spatial observation, the study documented campus landscape elements, mapped activity patterns, analysed the correspondence between landscape and activities, and classified campus zones as active or passive.

The major findings are clear. The campus landscape significantly affects movement, comfort, and patterns of use. Shade is the most important determinant of outdoor comfort and duration of stay. Outdoor spaces support some social interaction, but recreational and academic uses remain weak. A large proportion of campus space is underutilised, especially areas lacking shade, seating, maintenance, or good pathway access. This concern with the performance of the institutional environment is consistent with related findings from Caleb University, where accommodation quality has also been shown to affect staff performance (Ademakinwa et al., 2024).

Limitations

This study has several limitations. First, while the sample size of 300 respondents provides a robust quantitative dataset, the reliance on convenience sampling introduces limitations regarding the statistical generalisability of these findings. Second, the research relied heavily on self-reported perceptions, which may differ from actual observed behaviour over time. Third, the study was conducted at a single point in time and does not account for seasonal variation between dry and wet seasons. Finally, no direct environmental measurements such as temperature, humidity, or light intensity were taken, which limits more precise analysis of microclimatic effects on activity patterns.

Significance and Contribution

Despite these limitations, the study contributes to the limited literature on campus landscape quality in Nigerian private universities. It extends established environmental-behaviour frameworks to a tropical sub-Saharan African institutional context and provides practical insight into how university landscapes support or limit campus life.

The findings are also important in relation to broader Nigerian evidence on environmental quality and performance. The study reinforces the view that the quality of built and outdoor environments shapes academic, social, and institutional outcomes, not only in residential estates and universities generally, but also within Caleb University itself (Adeyemi et al., 2024; Ademakinwa et al., 2024).

Recommendations

Based on the integrated findings of this study, the following recommendations are proposed for enhancing the interaction between the campus landscape and campus activities at Caleb University:

1. Prioritise shade infrastructure. Plant additional shade trees and install canopy structures, pergolas, or shade sails in exposed areas—particularly along unshaded pathways, around the cafeteria, and in open spaces currently classified as passive zones. Given that shade was identified as the single most influential factor in outdoor activity duration, this intervention offers the highest potential return on investment for landscape improvement.
2. Provide outdoor seating at strategic locations. Install benches, sitting ledges, and informal seating elements beneath existing trees and in gathering areas. Priority locations include the cafeteria surroundings (identified as lacking seating despite high foot traffic), along major walkways, and at potential social nodes. Where possible, seating should be complemented with WiFi connectivity and charging facilities to support contemporary student needs.
3. Improve pathway connectivity and surface quality. Repair and pave deteriorated pathways, with particular priority given to routes to the boys' hostel and the Medicals/Psychology area—the two

locations most frequently cited as inaccessible. Create shortcut pathways that reduce walking distances between frequently used buildings. Level sloped areas where topography creates unnecessary difficulty.

4. Activate passive zones through targeted interventions. Transform underutilised spaces—particularly mini green fields and peripheral open areas—into functional outdoor environments through the coordinated addition of seating, shade, and programmatic elements such as outdoor study furniture, picnic facilities, or recreational installations. Small-scale interventions that introduce complementary softscape and hardscape elements can convert spatial liabilities into campus assets.
5. Rehabilitate and maintain the Love Garden. Address the specific maintenance deficiencies—insects, green mold, and the deteriorated access pathway—that currently deter a significant proportion of potential users from an otherwise valued campus space. Implement regular cleaning schedules, pest management measures, and pathway resurfacing. The Love Garden's existing tree canopy and network connectivity make it the campus space with the highest potential for enhancement through maintenance rather than major capital investment.
6. Commission a campus landscape master plan. Engage a qualified landscape architect to develop a comprehensive landscape master plan that coordinates future landscape development with building programmes, establishes design standards for outdoor spaces, and ensures that landscape investment is systematic, evidence-based, and aligned with the needs of the campus community—as specifically recommended by a respondent.

Suggestions for Further Research

Future research should expand the sample size and include more systematic behavioural mapping across different times of day and seasons. Comparative studies involving other Nigerian private universities would also help determine whether the conditions observed at Caleb University are part of a wider trend. Further studies could also integrate environmental measurements such as temperature, humidity, and wind conditions with behavioural data. Participatory design research involving students and staff in co-developing campus landscape improvements would also be valuable.

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