International Journal of Environment, Agriculture and Biotechnology
Vol-11, Issue-3; May-Jun, 2026
Peer-Reviewed International Journal
Journal Home Page Available: https://ijeab.com/
Journal DOI: 10.22161/ijeab

# Assessment of Landscape Elements Effectiveness on Users' Wellbeing in selected Tertiary Institutions in Lagos State

Tashok Yusuf H.[1], Babamboni Adekunle S.[2], Onwuamaegbu Will[3], Oderinde Oluwanifemi[4], Oginni Princess[5]

[1]Department of Architecture, Ambrose Alli University, Ekpoma, Edo
[2]Department of Architecture, Lagos State University of Science and Technology, Lagos
[3,4,5]Department of Architecture, Caleb University, Lagos
Corresponding Author: oderinde.oluwanifemi@calebuniversity.edu.ng

Received: 02 Apr 2026; Received in revised form: 30 Apr 2026; Accepted: 04 May 2026; Available online: 13 May 2026


***Abstract***— *Landscape elements within tertiary institutions play a significant role in enhancing users' physical, psychological, and social well-being by providing spaces for relaxation, interaction, and environmental comfort. In rapidly urbanizing environments such as Lagos State, public tertiary institutions often experience high population density and infrastructural pressure, making the quality and effectiveness of outdoor landscapes critical to users' daily experiences. However, many institutional landscapes face challenges such as poor maintenance, inadequate design, limited vegetation, and insufficient seating or shading, which may reduce their potential benefits. While previous studies have examined green spaces in urban contexts, limited research has focused on how specific landscape elements within tertiary institutions influence users' well-being. This study therefore assesses the effectiveness of landscape elements on users' well-being in selected public tertiary institutions in Lagos State. The objectives are to identify key landscape elements, examine users' perceptions, and evaluate their impact on physical, psychological, and social well-being. A quantitative research approach will be adopted using structured questionnaires and site observations. Data will be analyzed using descriptive and inferential statistics. The study aims to provide evidence-based recommendations for improving landscape design and management in tertiary institutions to enhance user well-being and overall campus experience.*

***Keywords***— ***Landscape elements, User well-being, Tertiary institutions, Campus environment, Green infrastructure, Lagos State.***

## I. INTRODUCTION

Landscape elements are essential components of campus environments, contributing significantly to environmental quality, user comfort, and overall well-being (Sadeq, Ismail, & Manaf, 2026). In tertiary institutions, outdoor spaces such as courtyards, gardens, walkways, and green areas provide opportunities for relaxation, social interaction, and informal learning.

In densely populated cities like Lagos, where academic environments are often characterized by intense schedules and high stress levels, access to well-designed landscapes becomes increasingly important (Akindejoye, Ezedinma, & Ike, 2021). Landscape elements such as trees, lawns, water features, and shaded seating areas help reduce environmental stressors, improve microclimate conditions, and promote mental and physical well-being (Tongyun, Wei & Fei, 2024).

Natural environments have been widely recognized for their restorative effects. The Attention Restoration Theory suggests that exposure to natural settings helps improve concentration and reduce mental fatigue, while the Stress Reduction Theory highlights the calming effects of green environments (Berto, 2014).

**Problem Statement**

However, despite the importance of landscape elements in

tertiary institutions, there are challenges such as poor landscaping maintenance and a lack of vegetation and green cover. Lack of usable outdoor furniture, Insufficient shading and thermal comfort, poor spatial planning of outdoor spaces.

These factors limit the potential of landscape spaces in promoting the well-being of users.

Moreover, there is a lack of empirical research that establishes the connection between certain landscape elements (vegetation, outdoor furniture, shading, walkways, among others) and the physical, psychological, and social well-being of users in Nigerian tertiary institutions.

**Aim of the study**

This study aims to assess the effectiveness of landscape elements on users" well-being in selected public tertiary institutions in Lagos State

**Objectives of the study**

The study aims to:

- Identify key landscape elements within selected tertiary institutions
- Examine users' perceptions and usage patterns of these landscape spaces
- Evaluate the relationship between landscape elements and users' well-being
- Provide recommendations for improving campus landscape design and management

## II. LITERATURE REVIEW

Landscape architecture is an essential tool for the promotion of health benefits. Various studies have shown that the presence of well-designed outdoor spaces is beneficial for physical health, reduces stress levels, and promotes social interaction.

Vegetation is one of the most important landscape elements, contributing to microclimate regulation, air quality improvement, and psychological restoration (Murugadoss, Singh & Thakur, 2024). Trees and green areas provide shade, reduce heat, and create calming environments that improve mood and reduce anxiety (Gungormus, & Pérez-Mármol,2025).

Accessibility and usability of outdoor spaces also influence their effectiveness (Yin, Wang, Xu, & Heng,2025). Well-connected walkways, seating areas, and open spaces encourage frequent use and social engagement (Alnaim, Dano & AlQahtany,2025).

Maintenance of the built environment is an essential determinant of user satisfaction. Poorly maintained built environments are not beneficial for the creation of user satisfaction.

### 2.1. Key Concepts

**Landscape Elements**

Landscape elements are the physical features of the outdoor environment. It includes the presence of vegetation, walkways, seating areas, water features, lighting, and space.

**User Well-Being**

User well-being is the physical comfort, psychological restoration, and social interaction experienced by the user of the environment.

**Campus Landscape**

Campus landscape is the outdoor spatial environment of an educational institution, encompassing all open spaces, natural elements, and built features that exist outside the enclosed structures. It includes a wide range of components such as green areas (lawns, gardens, and tree canopies), circulation networks (pedestrian walkways, roads, and bicycle paths), recreational and social spaces (courtyards, plazas, and sports fields), as well as hardscape elements like pavements, seating, lighting, and water features.

### 2.2. Conceptual Model

In this study, landscape elements are conceptualized as an independent variable impacting users' well-being in some public tertiary institutions in Lagos State. In more specific terms, landscape elements are defined by some critical physical and environmental attributes, including density of vegetation, provision of shades, provision of sitting areas, walkability, aesthetic qualities, and maintenance of landscape spaces. Together, they capture the quality and performance of outdoor spaces in campus environments.

Users' well-being is conceptualized as a multi-dimensional construct encompassing physical comfort, psychological restoration, and social interaction. Physical comfort pertains to users' thermal satisfaction and usability of outdoor spaces, while psychological restoration pertains to users' stress reduction and mental relaxation through landscape spaces, and finally, social interaction pertains to users' experience of communication and group activities through landscape spaces.

In essence, the conceptual model posits that better landscape qualities would positively impact each dimension of users' well-being, thereby enhancing overall users' satisfaction and experience in campus environments. Moreover, the model posits that landscape elements would not only positively impact users' well-being but also their conditions, designs, and maintenance would influence their effectiveness in impacting users' well-being.

### 2.3. Theoretical Framework

**Attention Restoration Theory**

Attention Restoration Theory (Kaplan & Kaplan, 1989) suggests that natural environments help individuals recover from mental fatigue caused by prolonged concentration and cognitive effort. Natural settings such as parks provide restorative experiences that improve mental focus and emotional balance.

**Stress Reduction Theory**

Stress Reduction Theory (Ulrich, 1984) proposes that exposure to natural environments reduces psychological stress and promotes relaxation. Green landscapes, water features, and open spaces create calming environments that enhance emotional well-being.

**Biophilia Hypothesis**

The Biophilia Hypothesis, introduced by Wilson (1984), suggests that humans have an innate connection with nature. Interaction with natural environments therefore satisfies psychological needs and contributes to improved well-being.

These theories explain why urban parks can significantly influence physical, psychological, and social well-being when properly designed and maintained.

## III. METHODOLOGY

This study adopts a quantitative approach to examine the relationship between landscape elements and users' well-being in selected public tertiary institutions in Lagos State. The methodology is designed to capture users' perceptions, behavioral patterns, and well-being outcomes associated with campus landscape usage, while also incorporating physical observations of landscape conditions. The approach integrates survey-based data with environmental assessment to provide a comprehensive understanding of how landscape attributes influence user experience. The methodological framework is structured to ensure representativeness, statistical reliability, and analytical depth suitable for empirical research in campus environmental studies.

### 3.1. Research Design

A quantitative research approach was adopted to assess the relationship between landscape elements and user well-being. This approach is widely used in environmental and public health studies to measure user perceptions and behavioral patterns Rhee, Ma, Seo, & Cha, 2022).

A cross-sectional research design was employed to collect data from park users at a single point in time. This design is appropriate for identifying relationships between environmental variables and human responses.

### 3.2. Study Area and Campus Selection

The study will be conducted in selected public tertiary institutions in Lagos State chosen based on Student population, Availability of landscape features and Accessibility

- Caleb University, Imota Lagos State
- Lagos State University of Science and Technology, Ikorodu Lagos State
- Lagos State University Teaching Hospital, Department of Medicine, Idi-araba, Surulere, Lagos State

**Sample Size and Sampling Technique**

A total sample size of 300 **respondents** was adopted to ensure statistical robustness. The sample was evenly distributed across the 3 universities (100 respondents per park).

A systematic random sampling method was adopted for collecting data. Every third user encountered during the study period in the chosen landscapes of the tertiary institution was chosen for the study, provided they were using the outdoor spaces of the institution and were willing to respond to the queries. This sampling method has reduced the chances of selection bias and has provided a wide coverage of various categories of users at different times of the academic session.

### 3.3. Data Collection Methods

**Questionnaire Survey**

A structured questionnaire was administered to respondents. The instrument was divided into

four major sections:

i. Demographic characteristics
ii. landscape accessibility and functionality
iii. aesthetic and ecological quality
iv. impact on physical health.

**Site Observation**

The campuses were assessed based on:

i. Vegetation quality
ii. Cleanliness
iii. Shading
iv. Seating availability
v. Accessibility

## IV. DATA ANALYSIS AND RESULTS

Data were analyzed using SPSS through:

i. Descriptive statistics (mean, frequency, percentage)

ii. Correlation analysis

iii. Multiple regression analysis

**DEMOGRAPHIC DISTRIBUTION**

*Table 4.1: Demographic Distribution*

| Demographic Variable | Category | Number | Percentage (%) |
|---|---|---|---|
| **Gender** | Female | 136 | 45% |
| | Male | 137 | 45% |
| | Prefer not to say | 27 | 9.1% |
| **Age** | 15–20 years | 245 | 80% |
| | 21–25 years | 54 | 17% |
| | 26–30 years | 2 | 0.3% |
| | 31 years and above | 0 | 0% |
| **Academic Level** | Undergraduate | 192 | 64% |
| | Postgraduate (MSc) | 96 | 32% |
| | Postgraduate (PhD) | 12 | 4% |
| **Average Hours Spent on Campus** | Less than 4 hrs | 63 | 21% |
| | 4–8 hrs | 192 | 64% |
| | More than 8 hrs | 45 | 15% |
| **Years Spent on Campus** | 1 year | 60 | 20% |
| | 2 years | 120 | 40% |
| | 3 years | 30 | 10% |
| | 4 years and above | 60 | 20% |

**LANDSCAPE ACCESSIBILITY AND FUNCTIONALITY**

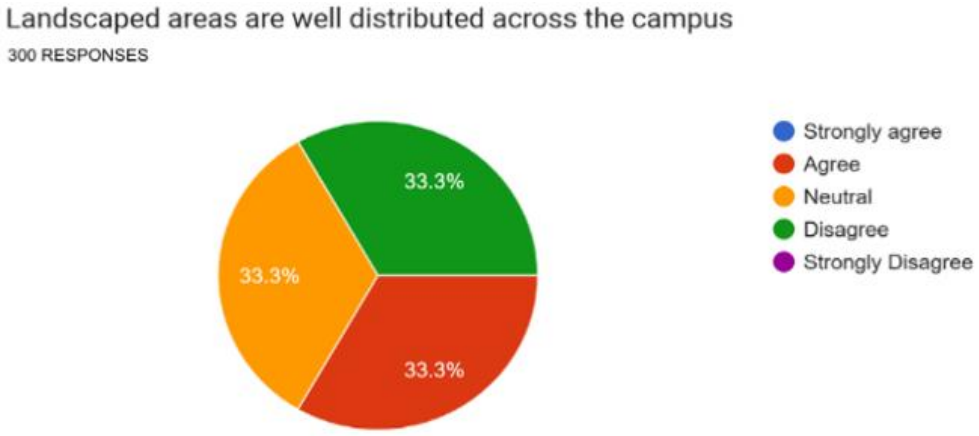


*Fig.1: Pie chart showing students access to landscape areas*

**ANALYSIS**

The results indicate a **mixed perception of landscape distribution across the campus**. While 36.4% of respondents agree that landscaped areas are well distributed, an equal proportion (36.4%) disagree, suggesting inconsistency in spatial planning. Additionally, 27.3% remain neutral, indicating uncertainty or variability in user experience.

Overall, this implies that **landscape distribution is not uniformly effective**, and improvements are needed to

ensure balanced accessibility across the campus destinations. Weekly usage dominance reflects structured recreational patterns, while daily users are more associated with physical exercise and routine relaxation activities.

**LANDSCAPE ELEMENTS CHARACTERISTICS**

*Table 4.2: Perception of landscape elements*

| Variable | Mean | Std. Dev |
|---|---|---|
| Vegetation Quality | 4.18 | 0.68 |
| Accessibility | 3.95 | 0.72 |
| Walkability | 3.88 | 0.75 |
| Maintenance Condition | 3.62 | 0.83 |
| Shading Provision | 3.79 | 0.77 |
| Seating Availability | 3.34 | 0.91 |

**Analysis**

Vegetation quality recorded the highest mean score, (4.18), which implies that students are highly satisfied with greenery and natural elements in the campus environment. Accessibility and walkability also recorded high mean scores, implying that most students can easily access landscaped environments.

However, seating availability recorded a lower mean score, (3.34), implying that students are concerned about insufficient outdoor furniture in the campus landscape. In addition, maintenance condition recorded a lower mean score, (3.62), implying that students are concerned about the poor maintenance of the campus landscape. Shading provision recorded a moderate mean score, implying that although some areas are comfortable, more improvement is needed.

**USER WELL-BEING INDICATOR**

*Table 4.3: Well-Being Indicators*

| Indicator | Mean | Std. Dev |
|---|---|---|
| Psychological Restoration | 4.26 | 0.63 |
| Mood Improvement | 4.08 | 0.69 |
| Physical Comfort | 3.87 | 0.74 |
| Social Interaction | 3.76 | 0.80 |

**Analysis**

Psychological restoration showed the highest mean value for psychological restoration, at 4.26. This showed that campus elements play a significant role in alleviating stress and promoting mental relaxation. Improvement of mood showed a high mean value, showing the positive effects of a green environment on mood.

For physical comfort, a moderate mean value of 3.87 was noted. This showed that physical comfort is generally satisfactory. For social interaction, a slightly low mean value of 3.76 was noted.

**Site Observation Analysis**

Observations in different tertiary institutions showed that:

- Areas with high vegetation density, such as tree canopies, showed higher concentrations of users, especially on hot days
- Inadequate seating arrangements resulted in a lower time spent in outdoor areas
- Shaded areas showed higher usage compared to open areas
- Maintenance levels directly affected users' perceptions of cleanliness and usage
- Walkways with good connectivity showed higher pedestrian activity

## 4.1. DESCRIPTIVE STATISTICS

Descriptive analysis based on 300 respondents revealed that:

- Most of the users belonged to the 18-30 age group, thus campus landscapes were used by young adults
- Frequent users of landscaped areas had higher well-being
- Landscapes with better vegetation, accessibility, and shading had higher satisfaction levels
- Landscapes with poor maintenance and insufficient seating had a negative effect on the comfort of users and increased usage

## 4.2. CORRELATION BETWEEN LANDSCAPE ELEMENTS AND USER WELL-BEING

**Correlation Analysis (Pearson's r)**

| Variables | Correlation (r) | Significance |
|---|---|---|
| Vegetation vs Psychological Restoration | 0.71 | $p < 0.01$ |
| Shading vs Physical Comfort | 0.64 | $p < 0.01$ |
| Seating vs Social Interaction | 0.58 | $p < 0.05$ |
| Maintenance vs Overall Satisfaction | 0.66 | $p < 0.01$ |
| Accessibility vs Usage Frequency | 0.60 | $p < 0.01$ |

**Interpretation**

A strong positive correlation exists between vegetation and psychological restoration, implying that the greener the campus environment, the better the mental well-being. There is also a strong positive correlation between shading and physical comfort, which implies the significance of the feature in the environment. The seating availability moderately correlates with social interaction, implying that the provision of seating areas can enhance the interaction of the environment's users. Maintenance condition has a strong impact on satisfaction, while accessibility has a significant impact on the use of the environment.

### 4.3. MULTIPLE REGRESSION ANALYSIS

A regression model was developed to predict overall well-being:

**Model Summary:**

- $R^2 = 0.66$
- Adjusted $R^2 = 0.64$
- $F(6, 293) = 142.5$, $p < 0.001$

**INFLUENCE OF PARK CHARACTERISTICS ON WELL-BEING**

**Regression Coefficients**

| Variable | Beta (β) | Significance |
|---|---|---|
| Vegetation | 0.45 | $p < 0.001$ |
| Shading | 0.33 | $p < 0.01$ |
| Maintenance | 0.29 | $p < 0.01$ |
| Accessibility | 0.21 | $p < 0.05$ |
| Walkability | 0.18 | $p < 0.05$ |
| Seating | 0.15 | $p < 0.05$ |

**Interpretation**

Vegetation was found to be the most important predictor of users' well-being, reinforcing the significance of green spaces in campus design. Shading and maintenance were also found to be important, suggesting that users' comfort with the environment, as well as maintenance, are vital. The model accounts for 66% of the variance in users' well-being, indicating a strong relationship between users' outcomes and landscape elements.

**SUMMARY OF FINDINGS**

This analysis has shown that:

1. Campus landscape elements contribute to psychological restoration and satisfaction
2. Vegetation and greenery have the greatest impact on user experiences
3. Shading and maintenance have a critical impact on physical satisfaction and comfort
4. Accessibility and walkability have an impact on the frequency of use
5. V Lack of seating provision impacts social interaction and stay duration

## V. DISCUSSION

The findings of this study confirm that landscape elements within public tertiary institutions significantly influence users' well-being in Lagos State. The strong relationship between vegetation and psychological well-being supports recent studies which show that exposure to green spaces is positively associated with improved mental health, reduced loneliness, and enhanced overall well-being (Zhang, Mavoa, Zhao, Raphael, & Smith, 2020).

The high impact of vegetation also aligns with contemporary research emphasizing the restorative capacity of natural environments, where interaction with greenery enhances cognitive functioning, emotional stability, and mental recovery (Wang, Lin, & Lin,2025). Within the campus context, this suggests that students exposed to well-designed green landscapes experience reduced academic stress and improved concentration levels.

Shading, accessibility, and overall spatial quality were found to significantly influence landscape usage, which is consistent with recent studies identifying accessibility, comfort, and safety as fundamental determinants of effective public space utilization and user engagement (Huang, Ye, & Chen, 2025). Similarly, maintenance conditions influenced user satisfaction, supporting recent findings that emphasize the importance of landscape quality and upkeep in enhancing user experience and perceived environmental value.

The findings also support recent research indicating that well-designed and frequently used green spaces contribute to improved life satisfaction, physical activity, and overall health outcomes. The high levels of psychological restoration, mood improvement, and physical comfort observed in this study further confirm the critical role of landscape elements in promoting users' well-being within tertiary institutions

### 5.1. Conclusion

This study, therefore, sought to investigate the significance of landscape elements in enhancing the well-being of users in tertiary institutions in Lagos State. From the study, the significance of vegetation, shading, maintenance, accessibility, walkability, and seating in enhancing the well-

being of users in tertiary institutions was confirmed. In particular, this study showed that vegetation is a very significant factor in enhancing the well-being of users in tertiary institutions in Lagos State. Shading and maintenance are also very significant factors in enhancing the well-being of users in tertiary institutions in Lagos State.

From this study, it is also evident that the campus landscape is highly used by young adults, particularly students in tertiary institutions in Lagos State. It is also evident that the campus landscape is a regular space used by users in tertiary institutions in Lagos State. However, the moderate levels of social interaction and physical comfort in the campus landscape suggest that more inclusive, functional, and user-centered design strategies are needed to cater to the diverse needs of users in tertiary institutions in Lagos State.

### 5.2. Recommendations

According to the findings, the study recommends that:

- Campus planners and administrators should strive for the incorporation of GI in tertiary institutions for psychological restoration and student well-being
- The management of institutions should strive for improved security and safety in the campus landscape for increased usage and user comfort
- Maintenance and management of the landscape should be enforced for sustainability of environmental quality and user satisfaction
- The landscape should be designed with adequate seats, shaded areas, and interactive spaces for increased social interaction and usage
- The campus landscape should be made inclusive, accommodating users of different ages, physical, and academic needs in the institution

## REFERENCES

[1] Sadeq, A. Z., Ismail, W. N. W., & Manaf, A. A. (2026). Green spaces design in university campus: A review of landscape practice of sustainability and students' well-being. *Malaysian Journal of Sustainable Environment, 13*(1), 165–190. https://doi.org/10.24191/myse.v13i1

[2] Akindejoye, F., Ezedinma, U., & Ike, N. (2021). A case study of urban design for wellbeing and mental health in Lagos, Nigeria. *Journal of Urban Design and Mental Health, 7*, 10. https://www.urbandesignmentalhealth.com/journal-7-case-study-lagos

[3] Tongyun, W., Wei, Z., & Fei, X. (2024). The role of landscape design in enhancing environmental sustainability and human well-being. https://doi.org/10.1016/j.landurbplan.2024

[4] Hartig, T., Mang, M., & Evans, G. W. (1991). Restorative effects of natural environment experiences. *Environment and Behavior, 23*(1), 3–26. https://doi.org/10.1177/0013916591231001

[5] Berto, R. (2014). The role of nature in coping with psycho-physiological stress: A literature review on restorativeness. *Behavioral Sciences, 4*(4), 394–409. https://doi.org/10.3390/bs4040394

[6] Murugadoss, D., Singh, H., & Thakur, P. (2024). Urban forests and microclimate regulation. In *Urban forests, climate change and environmental pollution*. Springer. https://doi.org/10.1007/978-3-031

[7] Gungormus, D. B., & Pérez-Mármol, J. M. (2025). Participating in tree planting improves mood, reduces stress, and alleviates anxiety. *Ecopsychology, 17*(2), 94–107. https://doi.org/10.1089/eco.2024

[8] Yin, B., Wang, L., Xu, Y., & Heng, K. C. (2025). A study on spatial perception and inclusive characteristics of outdoor activity spaces. *Buildings, 15*(6), 895. https://doi.org/10.3390/buil+dings15060895

[9] Alnaim, A. A., Dano, U. L., & AlQahtany, A. (2025). Factors influencing social interaction among neighborhood residents in public open spaces. *Future Cities and Environment, 11*. https://doi.org/10.5334/fce

[10] Rhee, J. H., Ma, J. H., Seo, J., & Cha, S. H. (2022). Review of applications and user perceptions of smart home technology. *Journal of Computational Design and Engineering, 9*(3), 857–889. https://doi.org/10.1093/jcde/qwac032

[11] Zhang, Y., Mavoa, S., Zhao, J., Raphael, D., & Smith, M. (2020). The association between green space and adolescents' mental well-being: A systematic review. *International Journal of Environmental Research and Public Health, 17*(18), 6640. https://doi.org/10.3390/ijerph17186640

[12] Wang, P., Lin, J., & Lin, W. (2025). Effects of restorative environments on mental health and its cognitive neural mechanisms. *Frontiers in Forests and Global Change, 8*, 1651800. https://doi.org/10.3389/ffgc.2025.1651800