

Landscape Design and Architecture for Outdoor Learning Spaces: A Case Study of Akanu Ibiam Federal Polytechnic Unwana, Nigeria

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Abstract

The Architecture of outdoor educational spaces has the potential to positively impact the learning process and the subject has consistently drawn the interest of designers, architects, and landscape architects alike. The purpose of landscape design is to create a sustainable and healthy environment that encompasses humans by incorporating, vegetation, water features, and structure to improve the quality of life. This research aims to propose a set of design guidelines and conceptual models for the improvement of the landscape at Akanu ibiam Federal Polytechnic Unwana, which can be used as a model for other tertiary institutions in Nigeria. The objective is to assess the current landscape design of Akanu Ibiam Federal Polytechnic Unwana. The research method is qualitative and quantitative and it is based on descriptive–interpretative approach. Purposive sampling was used to select two sites from open spaces in the school. Suitable models were designed for each of the selected sites. The study also conducts a literature review of existing research on the relationship between landscape and learning environment. The study established the importance of landscape in schools as it helps in reducing stress and tension levels that students experience throughout which leads to enhanced academic performance, and promotes positive environmental and behavioral outcomes in schools. The school landscape has the potential to enhance students' academic performance and self-assurance, promotes positive behavior and health, and facilitates the development of a wide range of skill.

Keywords: Designing, Outdoor, Learning Spaces, Architecture, Landscape Design.

Introduction

Often in design for a learning institution, whether it is a small-scale elementary school or a large college, the impression of the outdoors remains distinctly separated from the classroom. Outdoor spaces on campuses are largely intended for recess and play, while indoor spaces are planned for focus and learning. Recess is centralized around children laughing, college students napping or catching up with friends. These spaces are fundamentally separated from the classroom– the indoors being a space for learning, and the outdoors being a break from the learning. However, new studies encourage the use of outdoor spaces as learning environments which can be just as, if not more, successful than indoor learning spaces (Wilson, 2018). Landscape is defined as the design of outdoor areas, landmarks, and structures to achieve better environmental and social behavior, so the

absence of landscape in schools is a big fault, which affects the social and environmental behavior of the students. (Radwa & Inji, 2016). Tertiary Institution campuses are expected to look different than other places (Gumprecht, 2003). Campus “expresses something about the value of academic life, as well as its role as a citizen of the community in which it is located” (Dober, 1996). Today’s institutions of higher education must be robust spaces in which the learning environment encompasses more than technology upgrades, classroom additions, and its academic buildings – in fact, the entire campus, including its open spaces, must be perceived as a holistic learning space that provides a holistic learning experience (Gumprecht, 2003, Gutierrez, 2013, Kenney, Dumont, & Kenny, 2005.). Questions of where, when, how, and with whom today’s college students learn, confront the traditional notions of how university spaces are designed and used for effectiveness (Hashimshony & Haina, 2006). We propose that a well-designed landscape of an institution of higher education is an attentional learning resource for its students. Akanu Ibiam Federal Polytechnic Unwana has existed for over two decades. Open Spaces in this institution account for over 60% of the total space allocated to the school by the federal government. Landscapes in this institution have largely been untouched and have not been properly designed to suit the prestige of the school. The existing natural landscape is occasionally cleared when overgrown leaving most areas bare, rarely routes are designed to support outdoor spaces for social interaction. Although established campuses are well designed, over time they change as the number of students increases more educational buildings and facilities are added with no regard to social spaces. Very few hard landscapes exist, these spaces are most times made for car parks. There is no defined and intentional planning concerning the institution landscape. Learning is a lifelong and year-round pursuit, which takes place throughout the campus, not just fragmented indoors in designated instructional spaces (Bender & Parman, 2005, Strange & Banning, 2001). The above view is supported by Radloff who notes that only “one-fifth of a student’s time is spent in the classroom, contributing about one-quarter of the total learning variance (Radloff, 1998). Well-designed and connected networks of indoor and open spaces on campuses can be key, yet typically overlooked catalysts, in student learning and a strong influence on students’ initial and longstanding experiences that promote a sense of belonging to the learning community. (Greene, 2013). School landscape can play a significant role in delivering better outcomes, providing safe, stimulating environments where students can study, and explore, regardless of their educational needs. From research, we identify that students are having fewer opportunities for safe, challenging, dynamic, and collaborative environments. The absence of these opportunities can cause health issues and social and behavioral issues. School landscape can help increase achievement and confidence, and improve behavior and health; in addition, it helps students to develop an extensive range of skills. The landscape is the entrance of nature to people’s lives landscape makes up a major part of the human environment and has an impact on the quality of life of people, thus this research intends to outline the relationship between landscape and learning environment it also

investigates the concept of landscape and landscape architecture. Purposive sampling was used to select two sites from open spaces in the school. Suitable models were designed for each of the selected sites. The research method is qualitative and it is based on descriptive–interpretative approach.

Statement of Research problem

The architecture of outdoor educational spaces has been recognized as having the potential to positively impact the learning process. This subject has consistently attracted the interest of designers, architects, and landscape architects, who aim to create sustainable and healthy environments that improve the quality of life by incorporating vegetation, water features, and structures. While the importance of landscape design in schools has been acknowledged, there is a lack of specific design guidelines and conceptual models tailored to the unique context of Akanu Ibiam Federal Polytechnic Unwana and other tertiary institutions in Nigeria.

Therefore, the research problem addressed in this study is the absence of comprehensive design guidelines and conceptual models for the improvement of the landscape at Akanu Ibiam Federal Polytechnic Unwana, which can serve as a model for other tertiary institutions in Nigeria. The current landscape design at Akanu Ibiam Federal Polytechnic Unwana has not been systematically assessed, and there is a need to understand its strengths and weaknesses in relation to the potential enhancement of the learning environment.

To address this research problem, the study aims to propose a set of design guidelines and conceptual models specifically tailored to Akanu Ibiam Federal Polytechnic Unwana. The research will adopt a qualitative and quantitative research method, utilizing a descriptive–interpretative approach. Purposive sampling will be employed to select two open spaces within the school campus, and suitable models will be designed for each site. Additionally, a literature review will be conducted to examine existing research on the relationship between landscape and learning environments, establishing the importance of the landscape in schools for reducing stress, enhancing academic performance, and promoting positive environmental and behavioral outcomes.

By assessing the current landscape design at Akanu Ibiam Federal Polytechnic Unwana and developing design guidelines and conceptual models, this research seeks to contribute to the improvement of the learning environment in tertiary institutions in Nigeria. The study aims to enhance students' academic performance, self-assurance, positive behavior, and overall health, while facilitating the development of a wide range of skills.

Research Objectives

The objectives of this research are:

1. To assess the current landscape design of Akanu Ibiam Federal Polytechnic Unwana and identify its strengths, weaknesses, and opportunities for improvement in order to enhance the learning environment.
2. To propose a set of design guidelines and conceptual models specific to Akanu Ibiam Federal Polytechnic Unwana that can serve as a model for other tertiary institutions in Nigeria, with the aim of creating sustainable and healthy outdoor educational spaces that positively impact the learning process.

To achieve these objectives, the research will employ a mixed-methods approach, combining qualitative and quantitative methods. The research will utilize a descriptive-interpretative research method to analyze and interpret data gathered from the assessment of the current landscape design. Purposive sampling will be used to select two sites from open spaces within the school campus, which will serve as case studies for the development of suitable design models.

Theoretical and Conceptual Framework

The theoretical and conceptual framework for this research on is based on three main pillars: (1) the potential impact of landscape design on the learning process, (2) the creation of a sustainable and healthy environment through landscape design, and (3) the development of design guidelines and models for Akanu Ibiam Federal Polytechnic Unwana, with broader implications for other tertiary institutions in Nigeria.

1. **Impact of Landscape Design on Learning:** The first pillar of the framework focuses on understanding how the architecture of outdoor educational spaces can positively impact the learning process. This is grounded in existing literature that suggests outdoor environments play a significant role in enhancing academic performance, reducing stress levels, and promoting positive behavioral outcomes in students. The framework will draw on relevant educational theories, such as environmental psychology and experiential learning, to explore how elements of the outdoor environment can affect cognitive processes and overall well-being of students and staff.
2. **Creation of Sustainable and Healthy Environments:** The second pillar of the framework emphasizes the importance of creating a sustainable and healthy environment through landscape design. It recognizes the significance of incorporating vegetation, water features, and structures to improve the overall quality of life for students and the larger academic community. The framework will draw upon principles of sustainable design, biophilic design, and ecological concepts to underscore the positive effects of nature on mental and physical health, as well as the importance of harmonizing the built environment with the natural surroundings.
3. **Development of Design Guidelines and Models:** The third pillar of the framework aims to propose a set of design guidelines and conceptual models specific to Akanu Ibiam Federal Polytechnic Unwana. These guidelines and models will be developed

based on a qualitative and quantitative research method using the descriptive-interpretative approach. The research will utilize purposive sampling to select two open spaces within the campus, and suitable models will be designed for each site. The guidelines and models will take into account the unique characteristics and needs of the institution, considering factors such as climate, culture, and the educational objectives of the institution.

The research will also conduct a comprehensive literature review on the relationship between landscape and learning environments, synthesizing existing knowledge on the subject. This will help establish a robust theoretical foundation for the proposed design guidelines and models, while also identifying gaps in current understanding.

Overall, the theoretical and conceptual framework presented here will enable a holistic examination of the impact of outdoor educational spaces on the learning process, with a focus on creating sustainable and healthy environments. The research aims to provide valuable insights for improving the landscape at Akanu Ibiam Federal Polytechnic Unwana and offer a replicable model for other tertiary institutions in Nigeria, ultimately promoting a positive and conducive learning environment for students and educators alike.

Concept of Landscape and Landscape Architecture

Lands are empty spaces that exist irrespective of users once the spaces are used, they become "landscape". Landscape means a picture of nature that can be seen from a distance. (Mansouri, 2005) Landscape is not only in the way of bug space, a land with grass or trees but it also includes the small part of the green space that applies to the lifestyle and a part of human beings. (Nicha, 2022). The landscape is a part of the environment where we settle in and can be apparent due to our senses and this direct relation largely affects the quality of our lives. (Atashinbar, 2009). Life itself is dictated by our moment-by-moment modification to our environment. Just as the bacterial culture in the petri dish must have its scientifically compounded medium for ideal development and the potted geranium cutting its proper and controlled conditions of growth to produce a thriving plant, so we—as complicated, hypersensitive human organisms—must-have for our optimum development a highly specialized milieu. It is baffling that the nature of this ecological framework has been so little explored. Works have been carried out on the conditions under which rare types of orchids may best be grown; numerous handbooks can be found on the proper raising and care of guinea pigs, white rats, goldfish, and parakeets, but little has been written about the nature of the physical environment best suited to human culture. Human has rooted in nature and depends on natural forces (Norberg-Schulz, 2009.) landscape has an important role in making the relationship between nature and both human and human communities and also has a significant role in deepening this relation (Mansouri, 2005). Landscape architecture is part of the architecture. It is a part of every design. (Nicha, 2022). Landscape architecture involves much more than just planting a tree around the building post-construction. The main purpose of landscape architecture would be to the beauty and

use of outdoor space in the most beneficial way. In addition, the three-dimensional and environmental field of landscape design requires the designer to produce beautiful, practically useful, and well-functioning end products (Kara, 2013.) In a general sense, landscape architecture can be presented as the designing and planning of open spaces around human abodes on diverse scales and centered on their cultural perspective. (Shahidi, Ansari, & Yalpanian., 2008.) Landscape architecture deals with the intention of organizing the environment pleasantly, deals with designing exposed and exterior spaces (Razzaghi Asl, Faizi, & Behzadfar, 2012.) To put it simply, landscape architecture is the art and science of organizing land, spaces, and the elements on them to be used by humans in an appropriate, healthy, and pleasant way.

There are several other definitions of landscape architecture by several designers and landscape architects;

- **Frederick Law Olmstead** defined landscape architecture as the fine art of organizing and shaping the outdoor space for human enjoyment and environmental sustainability."
- **Ian McHarg**: "Landscape architecture is the analysis, planning, design, and management of natural and built environments, emphasizing ecological and cultural factors."
- **Walter Hood**: "Landscape architecture is the spatial art of environmental narrative, an expression of cultural ideas, ecological processes, and human aspirations."
- **Charles Eliot**: "Landscape architecture is the harmonious blending of art and science, creating beautiful and functional outdoor spaces for the betterment of society."

Accordingly, the designed environment from landscape architecture should be efficient, attractive, safe, and pleasant (American Society of Landscape Architects (ASLA), 2000).

Analyzing the presented definitions by landscape architects is indicative of the great closeness of the purpose of this field with that of architecture in creating and physically organizing human spaces, although the techniques and tools for achieving these goals are different (Adib, 2012). One of the main purposes of landscape designing is to integrate human technology (building) and the natural environment (Faizi & Khakzand, 2008).

Landscape architecture is also concerned with the arrangement of land, water, platforms, and structures, for their best and greater enjoyment. It deals with land-planning problems such as building sites, gardens, outdoor living areas, playgrounds, and parks. It requires knowledge of design and construction that overlaps with the fields of architecture, engineering, horticulture, botany, and other branches of the arts and science (Karl & Lohmann, 1983) The main purposes of landscape architecture have been summarized in three aesthetic, functional, and cultural clarification aspects. Thus, the instructions of landscape architecture, as an integrated part of the designing framework, should be considered in advance or in parallel with the designing process, especially as regards the learning environment.

Scholars	Perspective
Oxford Dictionary	Landscape means that all the visible features of an area of land, are often considered in terms of their esthetic appeal. Landscape architecture is the art and practice of designing the outdoor environment, especially designing parks or gardens together with buildings and roads (Oxford Advanced Learners Dictionary., 2000)
Longman Dictionary	Landscape means an area of countryside or land, considered in terms of how attractive it is to look at. Landscape architecture is the profession or art of planning the way an area of land looks, including the roads, buildings, and planted areas (Longman Advanced American Dictionary, 2007)
European Landscape Convention	The landscape is a formal expression of the relationships between individuals or a society with a topographically defined territory, the appearance of place (the result of actions over time), and natural and human factors (Shamsuddin, Sulaiman, & Amat, 2012)
Jackson and Man	Landscape is defined as a composition of man-made spaces with significant characteristics and land features, functioning and evolving to serve the community (Shamsuddin, Sulaiman, & Amat, 2012)
(Shamsuddin, Sulaiman, & Amat, 2012)	Landscape is the result of different interactions between components of the environment such as natural (that influenced by geology, soils, climate, flora, and fauna) and cultural (historical and current impact of land use, settlement, enclosure, and other human interventions), which perceived by people. (Shamsuddin, Sulaiman, & Amat, 2012)
Kara	Landscape is a culturally shared environment; made up of woods, mountains, waters, and fields, it is where we grow up and live.
Augustin Berque	Landscape is a social fact, a natural, subjective and objective, material, and cultural product that is real and symbolic. (Enache & Craciun, 2013.)
Pitte.	The landscape is the expression observable through the senses, of the earth's surface, resulting from the combination between nature, technology, and human culture. It is continuously changing, and it cannot be perceived otherwise but, in its dynamics, the history being the fourth dimension (Enache & Craciun, 2013.)

Enache and Craciun	The landscape is composed of areas – including the overall volumetric of its components (the morphology and the spatial structure), but also the activities, the processes, and the society that uses, consumes, and/or dwells in that space. (Enache & Craciun, 2013.)
Sprin	Landscape suggests the purposeful emotional and esthetic formation sense in history. Landscape language provides the dynamic integration of place and the dwellers (Sprin, 2008)
Razzaghi Asl, Faizi and Behzadfar	Landscape architecture, with the purpose of organizing the environment desirably, deals with designing open and outer spaces (Razzaghi Asl, Faizi, & Behzadfar, 2012.)
Shahidi, Ansari, and Yalpanian	In a general sense, landscape architecture can be introduced as the designing and planning of open spaces around human dwellings on different scales and based on their cultural perspectives (Shahidi, Ansari, & Yalpanian., 2008.)

Table 1: Different definitions of landscape and landscape architecture from different scholars' points of view (Motealleh, Parsaee, & sheybani, 2014).

Relationship between Landscape and Learning

Favorable landscaping directly or indirectly contributes to the learning process such as providing space for relaxation, interacting with landscape components, as well as outdoor lessons and revisions. An institution surrounded by a striking landscape is a stimulus to all students, teachers, school employees, and parents. The function of landscape in institutions are not just to beautify the surrounding and to provide shade but it should also assist the student's learning process and encourage them to love and appreciate the environment. Landscape moderates the temperature of the environment surrounding the schools. This is because plants that do the photosynthesis process play a substantial role by way of producing oxygen and taking in carbon dioxide that is released into the air (Wells, 2000). This, to a certain extent, helps to minimize the surrounding temperature. A study conducted by Han, (2009) shows that the students' interactions with plants could contribute to reducing negative emotions, increasing positive thoughts, reducing physical pressure, and developing the students' interest in learning. Plants affect human psychology. (Taylor, Kuo, & Sullivan, (2001), Hartig, Mang, & Evans, (1991), Kaplan, (1995) and Wells, (2000) The positive relationship between man and the environment could assist mental stability, improving behavior, and improve health conditions. Relationship with the environment means man's interaction with natural elements such as plants, water sources or outdoor surroundings (Kaplan, Kaplan, & Ryan, 1998) Contact with an outdoor environment without any limitations could reduce psychological pressure in our daily life. Thus, a landscape that has a distinctiveness and thought could assist in the learning process. Students experience the benefit of mental stability, relaxed mind, avoid stress and

pressure, improve their behavior, and improve their mental health by way of interaction and direct contact with the environment. In the context of the attention restoration theory Berman, Jonides, & Kaplan, (2008.), based on the analogy that the environment is closely connected with the mental stability of an individual; that being the proximity between the inclination of an individual who is to be recovered with the help of the environment. Relationship with the environment means that when a student is within the natural elements such as plants, water source, or an outdoor environment, the mind of the student would be experiencing peace, and feel fresh and relaxed. Relationship with the outdoor environment is not determined within a given period. It could happen within a short time but frequently. The psychological effect of this relationship is reduced mental pressure in the students daily life (Matsuoka, 2008). The theory of evolutionary-psycho is about the emotional reaction which plays a significant role in determining an individual's attitude towards the environment (Matsuoka R. , 2010).

Outdoor Campus Design

Designing outdoor landscapes on schools campus is very important for students who engage in many campus activities in order to meet academic goals. The landscape which is part of nature affects the student's mental and physical health beside that it affects the student's academic performance as it helps in stress reduction and calms the mind to be able to understand and concentrate again in the academic environment. (Meade, 2006). There are two main reasons colleges and polytechnics should be prioritizing outdoor spaces on their campuses: for first impressions, and for fostering a holistic or all-inclusive learning setting. First and foremost, the physical environment is one of many important influences that attract prospective students to college. However, these spaces cannot be designed simply for show. These spaces must go beyond the artificial and need to be a tool at the disposal of the students themselves. Well-planned educational environments are credited with being a main driver of student success, and therefore, "institutions themselves bear responsibility for the design and creation of campus environments, arranged appropriately for meeting educational purposes". Outdoor environments are just as important to student success as physical spaces such as a library, refectory, or campus square. Two primary types of outdoor spaces: learning and social, comprise the basic needs of students and faculty on polytechnic campuses. The need for progressive outdoor learning and social gathering spaces is becoming increasingly clear, and the responsibility lies on the polytechnic and its faculty to create them.

The quality of outdoor campus spaces can be determined by both the physical environment and user characteristics (Dicle, 2008, Abu-Ghazze, 1990, Marcus, 1990.)

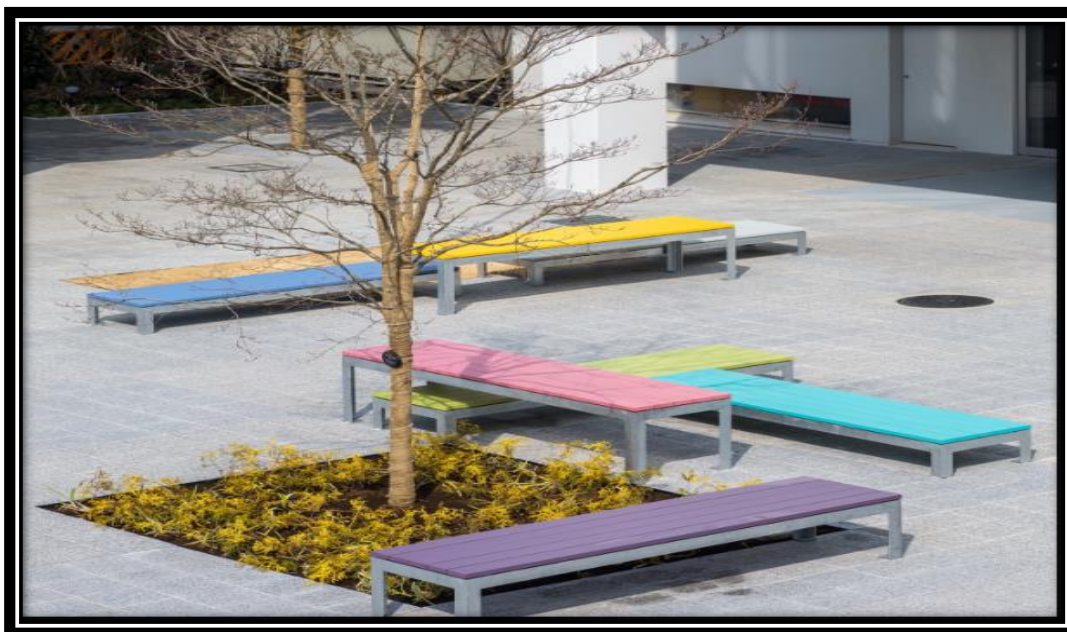


Plate 1: Showing an example of outdoor campus sitting in Jissen women University Hino campus, Tokyo Japan, Designed by STGK. (Source: www.Landzine.com)



Figure 1: Outdoor design for Hino Campus (Source: www.Landzine.com)

Outdoor spaces meant for learning shall have features within the physical environment that boost education and development, but also support social behaviors (Banning & Strange, 2001.) Student success depends largely on their physical environment, and spaces that utilize diverse environments can increase student adaptability, and provide locations where students naturally interact with a space in a productive manner. Moreover, diverse outdoor

spaces are proven to reduce student stress, increase concentration, and promote a healthy and active lifestyle.

Plate 1 and 2 show the design of an outdoor space in a college, the project was designed by Architect Hazama Ando and built-in 2016, and the site covers an area of 2900M². Open areas were dotted with trees that create shade and colorful benches of varying heights. The benches were aligned, linked, stacked, and arranged to cater to various activities on campus. The students can eat, talk, read, study, or even take a nap on the benches. The colors of the benches and their applications were co-designed with the students themselves. The students learn design concepts by creating an area and then observing how their area is used by others.

Outdoor Design space for Studying or Working in Small Groups (Under 4 Persons)

A sensational and robust space also heightens social interactions. Not only would small groups working on a school project, but small groups of friends looking to catch up, or play games outdoors can also be attracted to a space that feels energetic. Some common spaces on campus to find this type of space are a library, an atrium, or a large cafe. Each of these spaces offers many similar design attributes to that of the studying alone activity. These spaces are active, always changing, and energetic. Below are guidelines for creating working spaces for small groups of fewer than 4,

- Use of lightweight tables and chairs to accommodate moving and shifting of group positions when needed for discussion or comfort.
- Creating spaces that are visually appealing and inviting while creating a sense of safety,
- Provide hardscape ground surfacing.
- Provide colorful setting variables such as chairs, tensile shade options, and tables.
- Landscaping features can be used to give an illusion of privacy and comfort.
- Provide overhead and surrounding enclosure through the use of various materials and landscaping to enhance a sense of safety and comfort. (Wilson, 2018).

Outdoor Design Space for Studying or Working in Small Groups (Over 4 Persons)

The surrounding environment should always be considered when designing for students working in small groups of over 4. Some outer physical elements such as climate and location play important roles when choosing an outdoor space to use for gathering with a larger group. If an outdoor study area for large groups is being pelted by rain, or the temperature is sweltering hot with no shade, students will simply choose to meet indoors. Having various types of design features could add to the flexibility of the space, having some areas shaded, some not being shaded, and some being only partially shaded, which would further address climate changes that may occur. Below are guidelines for creating working spaces for small groups of over 4,

Plan for a space that allows for group expression;

- The use of circular arrangement tables and seating can allow for integrative group discussion.
- Construction of a small amphitheater space to allow for group presentations, class gatherings, or casual social interactions.

Designing Outdoor Campus Spaces for Relaxation

Spaces meant for relaxing have lots of adaptability from a design perspective, some typical spaces to see students relaxing are on large campus lawns. These spaces offer very few planned design attributes, they are very adaptable because they allow a user to make out of them what they desire. A person can choose to read a book, listen to music, watch people go by, lay under the shade of a tree, or do sport. A flat space for student relaxation is a very useful tool for aiding students in relieving stress because it would allow them to lay down to nap, or to lounge about with friends.

Design a space that facilitates various needs and desires for students looking to relax,

- Landscaping such as lawns and trees provides a natural setting escape from educational stress.
- The mix of tensile shade, tree shade, and sun areas.
- Area precisely designated for lounging, such as a space for hammocks or lounging seating.

Research Methodology

Research Design

The research design for this study is qualitative and quantitative employing a descriptive-interpretative approach. This approach allows for a comprehensive understanding of the current landscape design at Akanu Ibiam Federal Polytechnic Unwana and provides insights into the relationship between the outdoor educational spaces and the learning environment.

Sample Selection

Purposive sampling was utilized to select two sites from the open spaces within the Akanu Ibiam Federal Polytechnic Unwana campus. The selection of these sites was based on their suitability and relevance to the study objectives.

Data Collection

The data collection process consisted of two main components: site analysis and literature review.

- Site Analysis:** The selected sites were thoroughly analyzed to assess the current landscape design. This analysis involved observing and documenting various elements such as vegetation, water features, and structures present in the outdoor

educational spaces. Data on the physical characteristics, functionality, and aesthetics of the sites were collected through field observations, measurements, and photography.

- b) **Literature Review:** A comprehensive literature review was conducted to explore existing research on the relationship between landscape and the learning environment. This review involved gathering information from relevant academic journals, books, research papers, and online sources. The literature review aimed to establish the importance of well-designed landscapes in schools and their potential impact on student's academic performance, behavior, and overall well-being.

Conceptual Model Design

Based on the findings from the site analysis and the literature review, suitable conceptual models were developed for each of the selected sites. These models served as design guidelines for the improvement of the landscape at Akanu Ibiam Federal Polytechnic Unwana. The models incorporated principles of sustainability, health, and the creation of a conducive learning environment.

Data Analysis

The collected data from the site analysis and the literature review were analyzed using qualitative and quantitative analysis techniques. This involved organizing and categorizing the data, identifying patterns, and deriving meaningful insights related to the current landscape design and its impact on the learning environment.

Result

The results of this research study highlight the significance of landscape design in outdoor educational spaces and its potential positive impact on the learning process. Through the qualitative, descriptive-interpretative approach, the current landscape design of Akanu Ibiam Federal Polytechnic Unwana was assessed, leading to the development of design guidelines and conceptual models for its improvement. For this study, the two existing sites will be tagged as sites X and Y being sites one and two respectively.

Site Analysis



Plate 2: Showing site X being site one Located at the center of the tertiary Institution.
(Source: Author's field study)

Site Location

Both sites X and Y are located on the premises of the institution (Akanu Ibiam Federal Polytechnic Unwana) as shown below;



Figure 2: showing the site Location map of both Sites X and Y marked red.
(Source: Author's field study)



Figure 3: Site Location of Akanu Ibiam Federal Polytechnic, Unwana marked purple.

(Source: Author's field study)

Topographically, both sites X and Y are relatively flat as seen from Figures 4 and 5 below, though there is a depressed portion at the northwest side of site X. It is important to note that, the difference between contour lines is 500mm, and points marked yellow and green are the highest points on the site. There is also natural grass cover in both sites that have become Evasive. There is little or no activity in site X except for the footpaths and walkways which students cross to various locations around the institution. The Micro Finance Bank of the Akanu Ibiam Federal Polytechnic is located north of site X, which is the closest permanent structure to the site, apart from other temporary structure where business activities take place. An environmental measuring device is located at the southwest side of the site, with almost 60% of the site largely bare with no grass cover. The site is surrounded by man-made drainage which has prevented the top layer of the site from being completely eroded by run-off water. Site X covers a perimeter of 398.321m and an area of 11280.767m².



Figure 4: Showing the Satellite contour map of Site X
(Source: Author's field study)

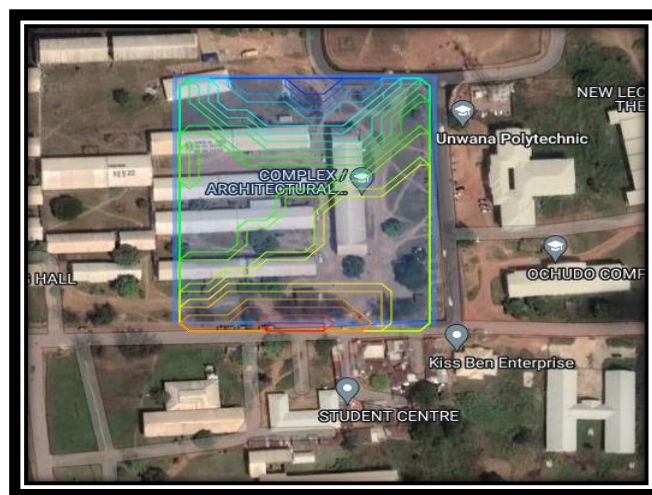


Figure 5: Showing the Satellite contour map of Site Y (Source: Author's field study)



Plate 3: Showing Y being sites Two, Located also at the Centre of the institution, this site is part of the Academic Complex (Source: Author's field study)

Site Y which is site two is part of the academic complex which houses ten lecture halls. As stated earlier, the site is relatively flat with naturally-occurring grass cover. Trees exist at the south and southwest part of the site, these trees will be incorporated into the design. It is also important to note that the south and south-west part of the site is part of the sitting area for the student largely because of the existing shades that the trees have provided. The sits made with concrete are not properly designed and constructed as the concrete mixture is also poor. These sits are scattered randomly on the site with no arrangement intended. On the south-east side there is an electricity transformer that occupies a small portion of the site. Proper man-made drainage surrounds the site with the adjoining road. The perimeter of site Y is 429.798m with an area of 6016.836m²

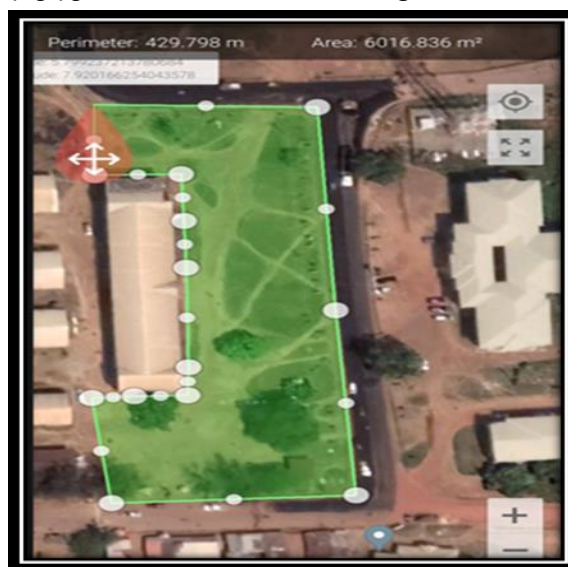


Figure 6: shows the surveyed site with the corresponding perimeter and area.
(Source: Author's field study)

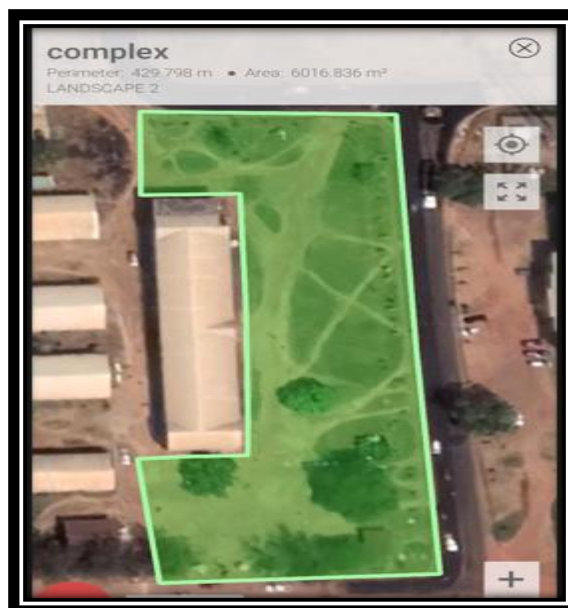


Figure 7: shows the surveyed site with the corresponding perimeter and area.

(Source: Author's field study)

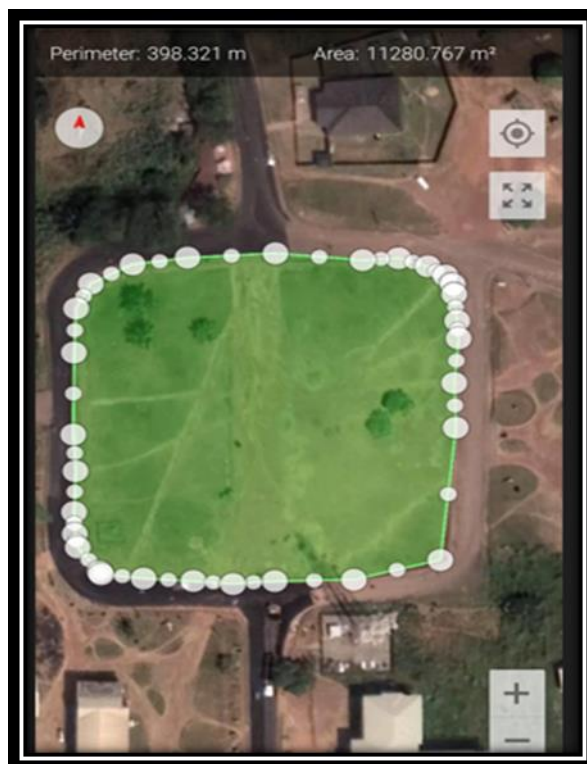


Figure 8: showing the survey of site X (Source: Author's field study)



Figure 9: showing the area and perimeter of site X. (Source: Author's field study)



Figure 10: shows the proximity of site X and Y. (Source: Author's field study)

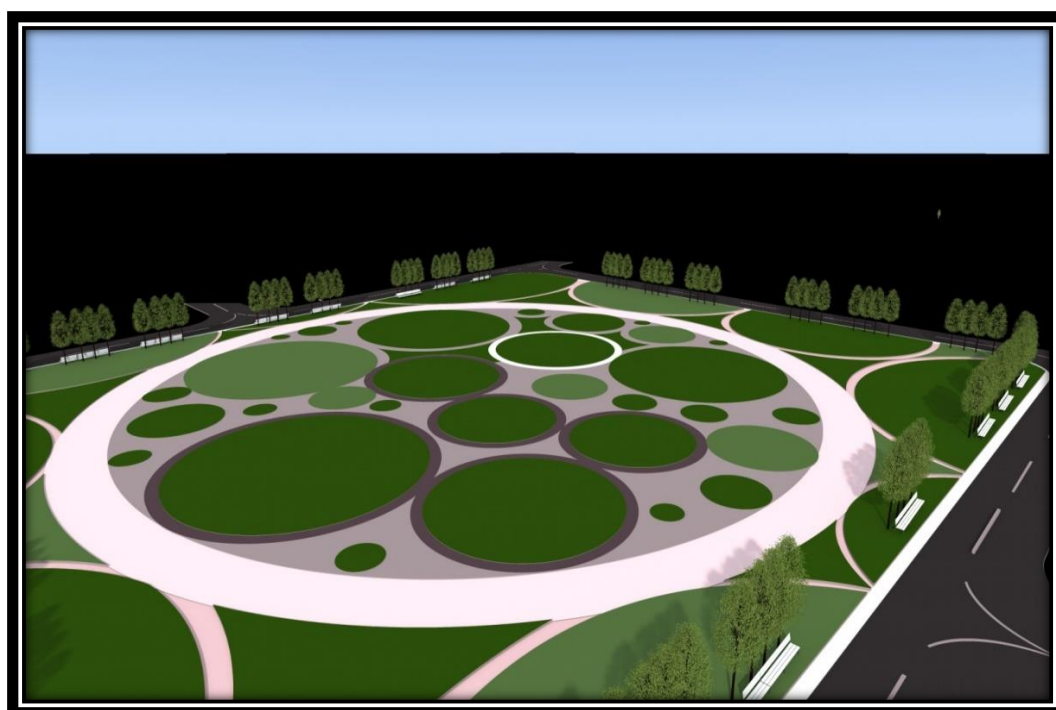


Plate 4: final rendered conceptual image of site X viewed from the south East (Source: Author's field study)

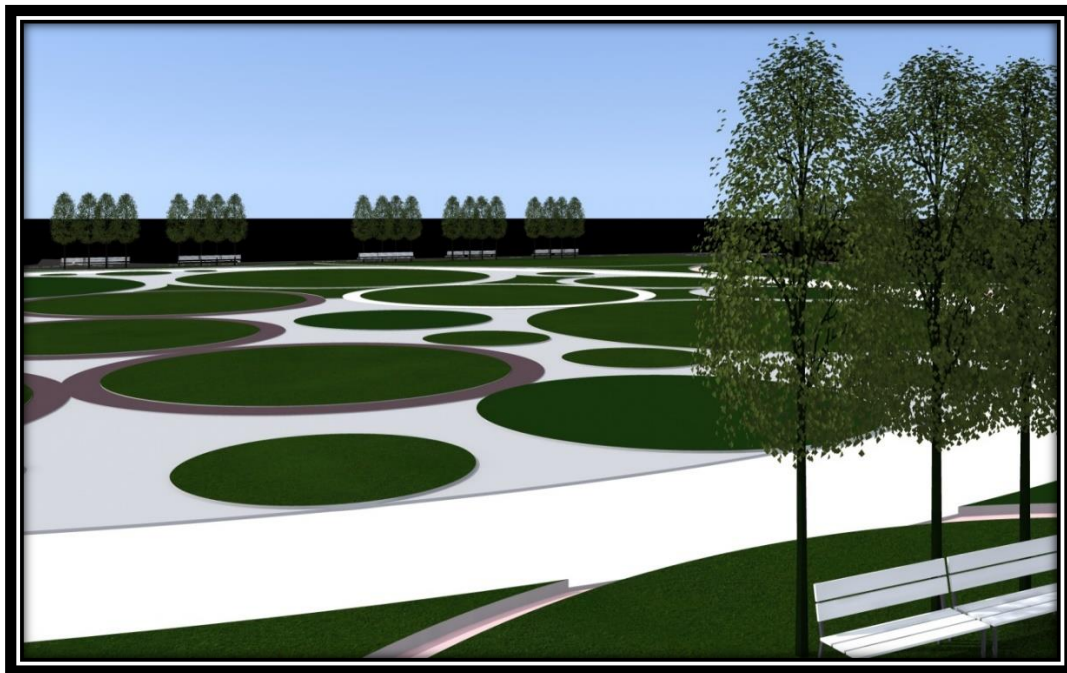


Plate 5: final rendered conceptual image of site X as viewed from the East.
(Source: Author's field study)

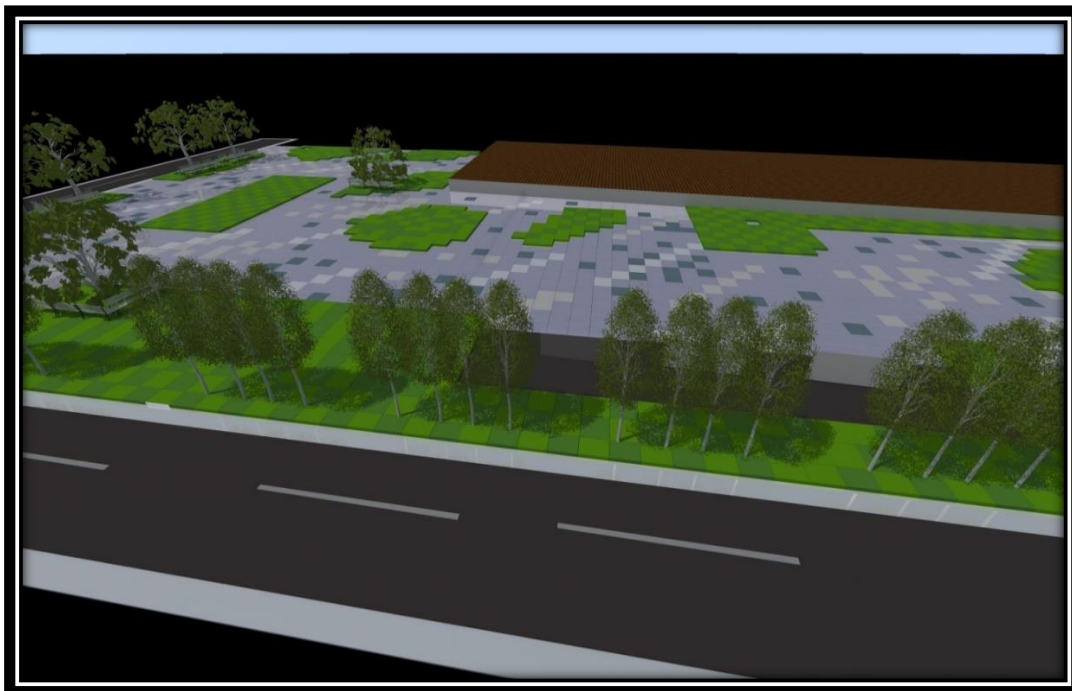


Plate 6: final rendered conceptual Image of Site Y as viewed from the East Elevation.
(Source: Author's field study)



Plate 7: Final rendered conceptual image of site Y as viewed from the south-east elevation.
(Source: Author's field study)

Discussion

The integral element of the design approach involves blurring the boundaries between the built environment and nature, seamlessly merging indoor and outdoor learning spaces. The concept of comfortable co-existence with nature within the learning environment underpinned the planning process. Spatial layouts were carefully devised to facilitate seamless of wind and infiltration of natural light while mitigating excessive heat. Seamless connectivity between all areas of the school was given utmost important. The design prioritized information sharing resulting in well planned sitting arrangement in both sites X and Y. The project addresses the school challenge of design less landscape, revitalizing the landscape as a hub for acquiring both academic and technical knowledge. The design team also addressed the region westerly winds and frequent storms by incorporating already existing trees to tackle the climate related concerns and also provide optimal ventilation and also organizing the open spaces.

Conclusion

The results of this research study highlight the significance of landscape design in outdoor educational spaces and its potential positive impact on the learning process. Through the qualitative, descriptive-interpretative approach, the current landscape design of Akanu Ibiam Federal Polytechnic Unwana has been assessed, leading to the development of design guidelines and conceptual models for its improvement.

The study findings indicate that well-designed landscapes can create sustainable and healthy environments that encompass humans. Incorporating elements such as vegetation, water features, and structures can contribute to an improved quality of life for students and staff within educational institutions.

The literature review conducted as part of this research supports the importance of landscape in schools. It revealed that a well-designed landscape can help reduce stress and tension levels experienced by students throughout the day. Furthermore, the study found that an optimized landscape design enhances academic performance, promotes positive environmental and behavioral outcomes, and contributes to students' overall well-being.

The research also demonstrated that the school landscape has the potential to enhance students' self-assurance, promote positive behavior and health, and facilitate the development of a wide range of skills.

Based on the analysis of the selected sites using purposive sampling, suitable models were designed for each site. These models serve as practical design guidelines and conceptual frameworks that can be applied to improve the landscape at Akanu Ibiam Federal Polytechnic Unwana. Additionally, these models can be used as a valuable reference and inspiration for other tertiary institutions in Nigeria seeking to enhance their landscape designs.

In conclusion, the research findings emphasize the importance of landscape design in outdoor educational spaces. They highlight the potential benefits of a well-designed landscape, including the reduction of stress and tension levels, positive environmental and behavioral outcomes, and enhanced overall well-being of students. The proposed design guidelines and conceptual models provide a valuable resource for improving the landscape at Akanu Ibiam Federal Polytechnic Unwana and serve as a model for other tertiary institutions in Nigeria aiming to create conducive and impactful learning environments.

Recommendation

Based on the findings and conclusions drawn from the research on the architecture of outdoor educational spaces and its impact on the learning process, the following recommendations are proposed:

- **Implementation of Design Guidelines:** Adopt and implement the design guidelines developed through this research at Akanu Ibiam Federal Polytechnic Unwana. These guidelines should focus on creating sustainable and healthy outdoor educational spaces by incorporating vegetation, water features, and structures. Consider the unique context of the institution, including climate, culture, and educational objectives, while applying the guidelines.
- **Replicability in Other Institutions:** Promote the dissemination and adaptation of the design guidelines and conceptual models to other tertiary institutions in Nigeria. Share the research findings and guidelines through workshops, conferences, and

publications, emphasizing the potential benefits of implementing similar improvements in outdoor educational spaces across the country.

- **Collaboration between Disciplines:** Encourage interdisciplinary collaboration among designers, architects, landscape architects, and educators to develop comprehensive and integrated approaches to landscape design in educational settings. Foster partnerships and dialogue to ensure that the learning environment is considered holistically, incorporating pedagogical approaches, environmental sustainability, and human well-being.
- **Continuous Evaluation and Feedback:** Establish a framework for ongoing evaluation and monitoring of the implemented design guidelines and conceptual models. Collect feedback from students, faculty, and staff to assess the effectiveness and impact of the improved outdoor educational spaces on academic performance, well-being, and behavior. Use this feedback to make necessary adjustments and improvements over time.
- **Research and Innovation:** Encourage further research and innovation in the field of landscape design for educational spaces. Support studies that explore the long-term effects of outdoor environments on learning outcomes, student engagement, and overall educational experiences. Investigate emerging technologies, materials, and design strategies that can enhance the quality and functionality of outdoor educational spaces.
- **Policy and Funding Support:** Advocate for policy changes and secure funding support at institutional and governmental levels to prioritize the improvement of outdoor educational spaces. Emphasize the importance of landscape design in educational environments and its potential to positively impact students' academic performance, well-being, and skill development.
- By implementing these recommendations, Akanu Ibiam Federal Polytechnic Unwana and other tertiary institutions in Nigeria can create enhanced outdoor educational spaces that contribute to a positive and enriching learning environment for students, promote well-being, and foster academic success.

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