

# Assessing the Impact of Biophilic Design on Vocational Training Environments for Orphans in Ikorodu: Opportunities and Challenges

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Abstract

Original Research Article

This study explores the impact of biophilic design on vocational training environments for orphans in Ikorodu, Lagos, aiming to enhance both educational and emotional outcomes. By integrating natural elements like light, ventilation, and greenery, the research examines how these features can improve learning experiences and support the emotional healing of orphaned children. Using a mixed-methods approach, the study gathers data from orphans, caregivers, instructors, and community leaders at Rotary Vocational Centre and Hikanos Orphanage Home. Findings highlight strong support for biophilic elements, such as natural light and outdoor spaces, in enhancing academic performance and emotional well-being. The study also identifies challenges, including inadequate infrastructure and financial barriers, and recommends incorporating biophilic design, improving emotional support systems, and addressing accessibility issues to create more inclusive and sustainable vocational training environments.

**Keywords:** Biophilic Design, Vocational Training, Orphans, Emotional Well-being, Educational Environment.

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## 1.0 INTRODUCTION

In recent years, the field of architectural design has experienced a growing shift towards sustainable and human-centered approaches that prioritize the physical, emotional, and psychological well-being of occupants. Among these approaches, biophilic design has emerged as a critical paradigm, drawing from the intrinsic human affinity for nature to enhance built environments (Kabinesh et al., 2024). Rooted in the theory of biophilia, which suggests that human beings possess an innate tendency to seek connections with nature and other forms of life, biophilic design integrates natural elements such as daylight, vegetation, water features, organic forms, and natural materials into architectural spaces. This integration has proven beneficial across various settings, particularly in improving cognitive function, emotional health, and productivity.

The application of biophilic principles is especially significant in educational and training environments, where the physical setting plays a pivotal role in shaping learning outcomes and overall development (Browning & Determan, 2024). For vulnerable populations such as

orphans who often grapple with emotional trauma, instability, and a lack of supportive social structures, the quality of the training environment becomes even more crucial. In contexts such as Ikorodu, Lagos, where socioeconomic disparities and infrastructural limitations pose additional challenges, the design and functionality of vocational training centers can influence not only the acquisition of technical skills but also the psychosocial well-being and future prospects of orphaned youth (Okon et al., 2020).

Vocational training has long been identified as a strategic pathway to economic empowerment and social integration, offering practical skill development that enhances employability. However, traditional vocational centers often neglect the environmental and psychological dimensions of learning, focusing narrowly on technical instruction without considering how spatial quality can influence learner engagement and mental resilience (Kalichak et al., 2025). This oversight is particularly detrimental in the case of orphans, who frequently require more than academic or technical instruction to thrive. They need spaces that are nurturing, restorative, and conducive to healing.

The aim of this study is to assess the impact of biophilic design on vocational training environments for orphans in Ikorodu, Lagos.

This study addresses these challenges by focusing on three objectives:

- i. To assess the current challenges and limitations of existing vocational training environments for orphans in Ikorodu with respect to educational delivery and psychological support.
- ii. To explore and integrate relevant biophilic design strategies that can improve the learning experience, emotional healing, and cognitive development of orphaned children in vocational education settings.
- iii. To develop an architectural design proposal for a vocational center that combines functional skill acquisition spaces with biophilic elements, fostering a sustainable, inclusive, and therapeutic learning environment for orphans.

## 2.0 LITERATURE REVIEW

The relationship between the built environment and human well-being has been a growing focus in architectural research. Biophilic design, which draws on the innate human connection to nature, has emerged as a key strategy in improving the quality of built spaces. This review explores the principles of biophilic design, its application in educational settings, and its specific relevance to vocational training environments for vulnerable populations, such as orphans in Ikorodu, Lagos.

### 2.1 Biophilic Design: Principles and Benefits

Biophilic design relies on the idea that humans have an innate connection with nature, which can be used to create more engaging and restorative settings (Richardson & Butler, 2021). The design method blends natural elements such as light, plants, water, and organic shapes into the built environment to meet human cognitive and emotional needs. One of the most significant advantages of biophilic design is its capacity to alleviate stress, increase creativity, and boost cognitive performance (Browning & Determan, 2024). Natural components in design have been shown to provide healing settings that minimize mental tiredness, improve focus, and general well-being. These advantages are especially relevant in environments where workers need to be both productive and emotionally supported.

The benefits of biophilic design are especially significant for vulnerable populations, such as orphaned children (El-Sayed et al., 2025). Orphans frequently experience emotional and psychological difficulties, such as trauma and instability. In these circumstances, the place people live in can have a significant impact on their capacity to heal, focus, and interact with instructional materials. Biophilic design can give these places a therapeutic feel, promoting emotional stability and engagement (Khatib et

al., 2024). These spaces not only provide a functional learning environment, but they also promote emotional healing, making them ideal for settings where both educational and personal development are important.

### 2.2 The Role of Biophilic Design in Educational and Vocational Training Environments

The role of biophilic design in educational environments has been well established. Studies have shown that well-designed learning spaces can improve educational achievements (Browning & Determan, 2024). A well-planned setting can improve concentration, reduce behavioral concerns, and boost student satisfaction. In vocational training settings, where practical skills are taught, physical space is critical in shaping students' ability to learn and apply knowledge. Integrating biophilic features into vocational training centers can benefit not only learning but also emotional well-being (Jaheen & El-Darwish, 2021).

The role of biophilic design in educational environments has been well established. Studies have shown that well-designed learning spaces can improve educational achievements. A well-planned setting can improve concentration, reduce behavioral concerns, and boost student satisfaction (Manca et al., 2020). In vocational training settings, where practical skills are taught, physical space plays a crucial role in shaping students' ability to learn and apply knowledge. Integrating biophilic features into vocational training centers can benefit not only learning but also emotional well-being (Gattullo et al., 2022).

### 2.3 Challenges in Implementing Biophilic Design in Vocational Training Centers

Despite the obvious benefits of biophilic design, its adoption in vocational training settings faces a number of hurdles. One of the major impediments is the high expense of adding biophilic components, particularly in low-resource environments. Green walls, sustainable materials, and outdoor spaces can be costly to incorporate, and many vocational training centers may lack the funds to do so (Tong, 2024).

Important stakeholders such as architects, educators, and politicians are frequently unaware of and unfamiliar with biophilic design principles. This knowledge gap may limit the broad adoption of biophilic concepts, as people in charge of planning or funding educational spaces may not fully understand the long-term benefits of adding nature into these environments (LS, 2024). Vocational training facilities must also strike a balance between the functional requirements of skill learning and the emotional and psychological needs of students (Van Nguyen et al., 2023). Careful planning is required to ensure that biophilic elements do not interfere with, but rather enhance, the primary educational goals.



## 2.4 Biophilic Design and Vulnerable Populations: The Case of Orphans in Ikorodu

The background of orphaned children in Ikorodu gives a unique opportunity to apply biophilic design principles. Orphaned children are frequently among society's most vulnerable groups, having endured trauma, neglect, and instability (Ntshuntshe & Taukeni, 2019). The absence of a consistent support system might have a severe impact on their emotional development and learning capacities. As a result, fostering surroundings that encourage emotional healing, security, and stability is critical in these settings.

Biophilic design can address these needs. Green spaces, natural light, and water features have been shown to have a calming, restorative effect on people, especially those who have been through trauma (Liu et al., 2021). These natural aspects can provide a sense of connectedness and stability, which is especially important for orphaned children who may feel estranged from their environment. Nature-based surroundings have been shown to lower anxiety and increase overall well-being, making them a valuable tool for boosting orphans' emotional and cognitive development at vocational training centers (El-Sayed et al., 2025).

In Ikorodu, where socioeconomic barriers frequently prevent access to quality education and infrastructure, biophilic design provides an opportunity to build more supportive and loving surroundings for orphaned youths (Aduwo & Akinwale, 2020). Integrating nature-based design components into vocational training facilities may create a setting that not only promotes skill acquisition but also encourages emotional healing, giving orphaned children the opportunity to reconstruct their lives in a sustainable and inclusive environment.

## 2.5 Research Gaps

While the benefits of biophilic design in educational and emotional settings are widely proven, there are significant gaps in the available knowledge, particularly for orphaned children and low-resource situations like Ikorodu (Ünal & Özen, 2021). Much of the current research on biophilic design has concentrated on general educational environments or those in high-income countries, with little attention paid to its application in developing countries or among vulnerable populations. There is a need for research that especially investigates how biophilic design concepts can be effectively used in such environments, taking into account the unique cultural, economic, and infrastructure aspects that influence design decisions.

The emotional and cognitive advantages of biophilic design are acknowledged; however, little study has been done to measure these benefits in orphans' vocational training settings. To learn more about how these design features specifically support cognitive development and emotional healing in kids who have suffered trauma, neglect, or loss, more research is required (Kopec &

Harte, 2020). This disparity emphasizes the value of empirical research evaluating the long-term effects of biophilic design in settings where emotional support is just as important as learning new skills.

Understanding the particular obstacles to applying biophilic design in low-resource environments like Ikorodu represents another important knowledge gap (Wijesooriya & Brambilla, 2020). Despite the obvious advantages of biophilic design, little research has been done on the knowledge-based, logistical, and budgetary difficulties of incorporating these features into vocational centers in places with limited resources. To find workable and reasonably priced solutions that can enable biophilic design in these settings, more research is required.

Research on how biophilic design can balance functional and emotional needs in vocational training settings is also lacking. Studies typically concentrate on either the functional utility or the emotional impact of design, but they seldom ever discuss how both might be combined to create a setting that is both successful and coherent. Creating vocational centers that address the entire spectrum of needs for orphaned children requires an understanding of how to combine the two design facets, making sure that the areas are both supportive of their emotional growth and conducive to learning (Helles, 2021).

## 3.0 METHODOLOGY

### 3.1 Research Designs

The research design for this study is structured as a case study research design integrated within a mixed-methods framework, providing both depth and breadth in the exploration of how biophilic design principles can be embedded within a vocational center for orphans in Ikorodu. This approach is chosen to ensure that the research not only uncovers rich qualitative insights but also supports these findings with measurable quantitative data, yielding a comprehensive understanding of both environmental and human-centered factors influencing architectural design for vulnerable populations. The case study design is anchored on two critical sites: Rotary Vocational Centre Igbogbo and Hikanos Orphanage Home Igbogbo, both situated in Ikorodu, Lagos. These case studies serve as empirical foundations for examining the architectural conditions of existing vocational and orphanage facilities within the local context. Data collection within this research design is triangulated across three primary methods: structured questionnaires, semi structured interviews, and observational field studies.

### 3.2 Study Population

The study population consists of key stakeholders involved in or affected by vocational training and orphanage facilities in Ikorodu, Lagos. Specifically, it includes: Orphans residing at Hikanos Orphanage Home, Igbogbo, who are potential beneficiaries of vocational training, Vocational trainees, instructors, coordinators,



and students at Rotary Vocational Centre, Igbogbo, who are engaged in skill acquisition within existing vocational spaces, Parents/guardians of orphans, providing insights into caregiving and emotional support needs, Community leaders and government/NGO officials, who offer perspectives on socio-economic and policy-related aspects of vocational training and orphan care. The precise number of potential respondents within the target population is indeterminate.

### 3.2.1 Sampling

The purposive sampling technique is adopted for this study because of its capacity to deliberately target participants who have the experience, knowledge, or emotional engagement with the architectural spaces under examination. In the context of architectural research addressing biophilic principles in sensitive environments such as orphanages and vocational centres, random sampling would risk engaging respondents without meaningful experiential connections to the study's focus. By contrast, purposive sampling ensures that the data gathered is rich, relevant, and directly applicable to the study's objectives. This includes the direct involvement of orphans at Hikanos Orphanage, vocational instructors and trainees at Rotary Vocational Centre, caregivers, and key stakeholders involved in both facilities.

### 3.3 Sample Size Calculation

The study employs Cochran's formula for calculating the sample size from an infinite population, suitable due to the indeterminate size of the target population. The formula used is

$$n_0 = \frac{Z^2 \times p \times q}{e^2}$$

Where:

$n_0$  = Required sample size

Z: Standard normal deviation at a 95% confidence level ( $Z=1.96$   $Z = 1.96$   $Z=1.96$ )

p: Estimated proportion of the population (assumed as 0.5 for maximum variability)

q:  $1-p=0.5$   $1 - p = 0.5$   $1-p=0.5$

e: Margin of error ( $e=0.07$   $e = 0.07$   $e=0.07$ )

$$n_0 = \frac{1.96^2 \times 0.5 \times 0.5}{0.07^2}$$

$$n_0 = \frac{3.8416 \times 0.25}{0.0049}$$

$$n_0 = \frac{0.9604}{0.0049}$$

$$n_0 \approx 196$$

### 3.4 Data Collection

This study employs a mix of primary and secondary data collection methods to capture both empirical and scholarly insights. The instruments are designed to address the architectural, environmental, emotional, and educational dynamics at the two case study sites: Rotary Vocational Centre, Igbogbo, and Hikanos Orphanage Home, Igbogbo, Ikorodu.

**Primary Data:** Primary data is collected using two main instruments: structured observation schedules and structured questionnaires. The observation schedules are used during site analysis to systematically record architectural elements such as spatial organization, ventilation, natural lighting, material use, landscaping, and biophilic integration. These observations follow established frameworks to ensure consistency and alignment with architectural benchmarks (Bekkering et al., 2021; Brambilla & Wijesooriya, 2020). Structured questionnaires are distributed to key stakeholders at both case study sites. The questionnaires gather both quantitative and qualitative data, covering demographics, spatial comfort, emotional well-being, accessibility, and suggestions for improvement. These responses will provide insights into how biophilic design could enhance both educational and emotional outcomes for the participants.

**Secondary Data:** Secondary data is gathered through an extensive literature review, including academic publications, technical reports, and professional studies on biophilic design principles, vocational education infrastructure, and the socio-emotional realities of orphans in institutional care. Relevant sources include studies on biophilic design principles (Agboola, 2024; Hazazi & Asojo, 2025; Plotnikova, 2021), vocational education infrastructure (Akinola et al., 2019; Alagbe & Oyedele, 2020), and research on orphans' emotional and psychological experiences (El-Sayed et al., 2025; Eneji & Archibong, 2020). This secondary data supports the theoretical foundation of the research and helps situate the study within broader academic and professional discourses, identifying gaps and providing comparative benchmarks for the proposed architectural solutions.

### 3.5 Data Analysis

This study employs a mixed-methods approach for data analysis, integrating both quantitative and qualitative techniques to thoroughly examine the research objectives. Quantitative data collected from structured questionnaires administered to orphans, caregivers, vocational trainees, and instructors are analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics such as frequencies, percentages, and mean scores are used to summarize the distribution of responses, providing insights into perceptions of spatial quality, learning environments, and biophilic design features. Inferential statistical techniques may be applied to explore relationships between demographic characteristics and spatial perceptions.



Qualitative data from observational studies and open-ended questionnaire responses are analyzed using thematic analysis with NVivo software. This process involves transcribing and coding responses to identify emerging themes such as spatial comfort, environmental connection, emotional well-being, and user engagement with natural elements. NVivo helps organize and visualize the data, enabling the researcher to connect recurring patterns to key research questions.

By triangulating data from SPSS outputs, NVivo analyses, and the literature review, the study ensures both the reliability and contextually rich findings. This comprehensive analytical framework supports the formulation of evidence-based architectural recommendations for improving vocational learning spaces for orphans in Ikorodu, enhancing both the academic rigor and practical relevance of the research.

## 4.0 FINDINGS AND DISCUSSION

This analysis presents key findings from a comprehensive survey of 196 stakeholders (including orphans, parents/guardians, vocational trainees, and community leaders) regarding the proposed Vocational School for Ikorodu Metropolis. The results are structured around the project's three core objectives.

### 4.1 Demographics Analysis

The gender composition of the respondents shows a significant predominance of male participants (73.5%), while female participants represent 26.5% of the sample. This skew may reflect gender-based accessibility or participation levels in vocational training environments. The data suggests a potential need to explore gender inclusivity strategies within vocational education planning.

**Table 1: Gender Distribution**

	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>				
<b>Male</b>	144	73.5%	73.5%	73.5%
<b>Female</b>	52	26.5%	26.5%	100.0%
<b>Total</b>	<b>196</b>	<b>100%</b>	<b>100%</b>	

A majority of the participants fall within the 18–25 years age group (86.7%), indicating that vocational training engagement is highest among young adults. Only a small proportion is aged 26–35 (6.6%) and 46–55 years (6.6%), with no respondents in the 36–45 age bracket. This

concentration of younger participants highlights the importance of targeting youth-centric interventions, while also questioning the underrepresentation of middle-aged groups.

**Table 2: Age Distribution**

	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>				
<b>18 - 25 years</b>	170	86.7%	86.7%	86.7%
<b>26 - 35 years</b>	13	6.6%	6.6%	93.3%
<b>36 - 45 years</b>	0	0.0%	0.0%	93.3%
<b>46 - 55 years</b>	13	6.6%	6.6%	100.0%
<b>Total</b>	<b>196</b>	<b>100%</b>	<b>100%</b>	

The largest respondent group is vocational trainees (39.8%), followed closely by parents/guardians (36.7%), reflecting the dual stakeholder nature of the study. Other categories include community leaders (19.9%), trainers/instructors (6.6%), and a smaller representation

from government and NGO officials (3.6%). This spread offers a comprehensive understanding of vocational training perceptions across both direct beneficiaries and institutional stakeholders.



**Table 3: Participant Category**

	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>				
<b>Parent/Guardian</b>	72	36.7%	36.7%	36.7%
<b>Vocational Trainee</b>	78	39.8%	39.8%	76.5%
<b>Community Leader</b>	39	19.9%	19.9%	96.4%
<b>Vocational Trainer/Instructor</b>	13	6.6%	6.6%	103.0%
<b>Government/NGO Official</b>	7	3.6%	3.6%	106.6%
<b>Total</b>	<b>196</b>	<b>100%</b>	<b>100%</b>	

*Note: Cumulative % exceeds 100% due to rounding; adjusted in SPSS output.*

A majority of respondents possess a tertiary education qualification (73.5%), suggesting a highly literate population sample. Vocational training graduates and those with secondary education are equally represented at

13.3% each. This indicates that even among vocational stakeholders, formal academic education remains dominant, potentially influencing attitudes toward vocational education pathways.

**Table 4: Educational Background**

	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>				
<b>Tertiary education</b>	144	73.5%	73.5%	73.5%
<b>Vocational training</b>	26	13.3%	13.3%	86.8%
<b>Secondary education</b>	26	13.3%	13.3%	100.0%
<b>Total</b>	<b>196</b>	<b>100%</b>	<b>100%</b>	

#### 4.2 Objective 1: Challenges in Existing Vocational Training Environments

Out of the total respondents, 73.0% (n = 143) indicated they had participated in a vocational training

program, while 27.0% (n = 53) had not. This high level of participation suggests a strong interest and involvement in vocational education, potentially due to the need for alternative skill acquisition outside formal academic structures.

**Table 5: Participation in Vocational Training Programs**

	Frequency	Percent
<b>Ever Participated?</b>		
<b>Yes</b>	143	73.0%
<b>No</b>	53	27.0%
<b>Total</b>	<b>196</b>	<b>100%</b>

Among those who had participated in vocational training, the majority rated the quality of the programs positively, with 40.6% describing them as Excellent and 34.3% as Good. A smaller percentage rated their experience as Fair (17.5%) or Poor (7.7%). These ratings suggest that while

most beneficiaries found the training beneficial, there is room for improvement in content delivery, facilities, or instructional quality to address the concerns of the minority.



**Table 6: Quality Rating of Programs (Participants Only, \*n\* = 143)**

Rating	Frequency	Percent
Excellent	58	40.6%
Good	49	34.3%
Fair	25	17.5%
Poor	11	7.7%
<b>Total</b>	<b>143</b>	<b>100%</b>

Social and psychological factors were also significant, with social stigma/discrimination (32.7%) and lack of emotional or psychological support (32.1%) affecting participation. Accessibility challenges were noted, with 28.1% citing a lack of accommodation for physical

disabilities. Open-ended responses revealed poverty (19.9%) and low educational background (14.3%) as additional barriers. These insights underscore the need for targeted interventions, including financial aid, community awareness, and inclusive facility design.

**Table 7: Barriers to Access (Multiple Response Analysis)**

Barrier	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Financial difficulties	112	57.1	57.1	57.1
Lack of information about programs	102	52.0	52.0	109.2
Inaccessible locations	80	40.8	40.8	150.0
Inadequate facilities/equipment	72	36.7	36.7	186.7
Social stigma/discrimination	64	32.7	32.7	219.4
Lack of emotional/psychological support	63	32.1	32.1	251.5
Physical disabilities not accommodated	55	28.1	28.1	279.6
<b>Open-Ended: Other Barriers</b>				
Poverty (from open-ended responses)	39	19.9	19.9	299.5
Low educational background	28	14.3	14.3	313.8

### 4.3 Objective 2: Biophilic Design Strategies

The data shows strong support for integrating biophilic elements into vocational training environments. The highest-rated feature was access to natural light and ventilation with a mean score of 4.32 and 64% rating it as 'Very Important', indicating that air quality and lighting are critical for learning comfort. A safe and secure environment (M = 4.28) and outdoor learning spaces (M

= 4.19) followed closely in importance. Features such as indoor greenery (M = 4.05) and quiet natural zones (M = 3.97) also scored well, reflecting their perceived role in emotional recovery and focus. Gardens for relaxation (M = 3.89) and residential facilities (M = 3.75) were moderately valued but still seen as beneficial, especially for vulnerable learners such as orphans and rural migrants. These findings support the design of nature-integrated, emotionally sensitive learning environments.

**Table 8: Importance of Biophilic Features (Scale: 1-5)**

Feature (N=196)	Mean	Std. Deviation	"Very Important" %
Access to natural light & ventilation	4.32	0.87	64%
Safe/secure environment	4.28	0.91	63%
Outdoor learning spaces	4.19	0.95	61%
Indoor plants/greenery	4.05	1.02	58%
Quiet zones with natural elements	3.97	1.08	55%
Gardens for relaxation	3.89	1.12	53%
Residential facilities	3.75	1.21	50%



A combined 92.3% of respondents either “strongly agreed” (56.1%) or “agreed” (36.2%) that biophilic design features have a positive impact on emotional well-being. Only 7.7% were neutral, and no respondents

disagreed. This overwhelming consensus reinforces the psychological value of incorporating nature into educational architecture, particularly for emotionally vulnerable groups.

**Table 9: Impact on Emotional Well-being**

	Frequency	Percent
<b>Strongly Agree</b>	110	56.1%
<b>Agree</b>	71	36.2%
<b>Neutral</b>	15	7.7%
<b>Total</b>	<b>196</b>	<b>100%</b>

Respondents prioritized financial independence (Mean Rank = 1.8) and improved employability (Mean = 2.1) as the most important goals of vocational training. These outcomes were selected among the top three by 68% and 59% of participants, respectively, indicating a strong alignment with economic empowerment objectives. Enhanced self-esteem (52%) and social integration (41%)

were also valued, reflecting the need for psychosocial development alongside technical skills. Reduction in poverty (36%), though ranked lower, remains relevant as a long-term outcome. This ranking reflects the dual focus of vocational education on both economic mobility and social-emotional growth.

**Table 10: Desired Outcomes (Ranked Top 3)**

Outcome	Mean Rank	Selected as Top 3 (%)	Valid Percent (%)	Cumulative Percent (%)
<b>Financial independence</b>	1.8	68	68.0	68.0
<b>Improved employability</b>	2.1	59	59.0	127.0
<b>Enhanced self-esteem</b>	2.5	52	52.0	179.0
<b>Social integration</b>	3.2	41	41.0	220.0
<b>Reduction in poverty</b>	3.7	36	36.0	256.0

### 4.3.4 Objective 3: Architectural Design Proposal

The data reveals the top five vocational skills in demand among respondents. Information Technology (76.0%) emerged as the most preferred skill, highlighting the increasing relevance of digital literacy in today’s job market. Tailoring/Fashion Design (72.0%) and Electrical

Installation (67.9%) were also highly prioritized, reflecting traditional trade relevance. Culinary Arts (65.3%) and Hairdressing/Beauty Therapy (60.2%) completed the list, pointing to the strong interest in creative and service-oriented professions. These findings should inform training curricula and resource allocation in vocational centres to match learner aspirations and market demands.

**Table 11: Top Vocational Skills Demand (Multiple Response)**

Skill	Responses (Frequency)	Percent of Cases (%)	Valid Percent (%)	Cumulative Percent (%)
<b>Information Technology</b>	149	76.0	76.0	76.0
<b>Tailoring/Fashion Design</b>	141	72.0	72.0	148.0
<b>Electrical Installation</b>	133	67.9	67.9	215.9
<b>Culinary Arts</b>	128	65.3	65.3	281.2
<b>Hairdressing/Beauty Therapy</b>	118	60.2	60.2	341.4



Support systems are critical to the success of vocational learners. The most frequently identified service was financial aid/scholarships (72%), confirming that cost remains a major access barrier. Career guidance and job placement (69%) ranked second, emphasizing the need for structured transitions from training to employment. Psychological counselling (64%) and life skills training

(61%) also received strong support, highlighting the importance of emotional support and personal development in sustaining vocational outcomes. These services are essential for equipping learners especially vulnerable groups with resilience, confidence, and workplace readiness.

**Table 12: Essential Support Services**

Service	% of Cases
Financial aid/scholarships	72%
Career guidance & job placement	69%
Psychological counselling	64%
Life skills training	61%

The alignment of identified challenges with practical solutions provides a strategic roadmap for sustainable and inclusive vocational centre development.

**Table 13: Anticipated Challenges and Recommended Solutions (N = 196)**

Challenge	Frequency	Percent of Cases (%)	Valid Percent (%)	Cumulative Percent (%)	Recommended Solution
Funding shortages	161	82.0	82.0	82.0	Public-private partnership (PPP); CSR grants
Maintenance costs	145	74.0	74.0	156.0	Solar panels; rainwater harvesting
Social stigma	123	62.8	62.8	218.8	Community sensitization programs
Location accessibility	112	57.1	57.1	275.9	Multi-campus zoning strategy

## 5.0 CONCLUSION AND RECOMMENDATION

### 5.1 Conclusion

This study explored the potential of biophilic design to improve vocational training environments for orphans in Ikorodu, Lagos. Biophilic design can contribute significantly to cognitive and emotional development by incorporating natural elements into educational spaces, particularly those serving vulnerable populations such as orphans. The study identified key challenges in current vocational training environments, including inadequate facilities, a lack of emotional support, and limited accessibility. This study indicates through a thorough analysis that biophilic design components such as natural light, ventilation, outdoor learning areas, and greenery are not only useful for emotional healing, but also crucial in improving learning experiences and promoting resilience among orphans. The data gathered from both primary and secondary sources emphasizes the significance of creating environments that are both educationally functional and

emotionally supportive. Stakeholders, including orphans, caretakers, vocational instructors, and members of the local community, were overwhelmingly supportive of incorporating biophilic features into vocational training environments. This displays a good understanding of the psychological and cognitive benefits that nature-based design provides, especially in settings where people experience emotional and psychological obstacles.

### 5.2 Recommendation

- i. Integration of Biophilic Design: Vocational training centers for Ikorodu orphans should adopt biophilic design principles, incorporating natural light, ventilation, indoor plants, and outdoor learning spaces, to enhance cognitive performance and emotional resilience.
- ii. Focus on Emotional Support: The study highlights the importance of architectural spaces that promote emotional healing and psychological well-being, such as quiet zones, therapeutic gardens, and relaxation areas, for orphaned children's better vocational training.



- iii. Community and Stakeholder Engagement: Implementing community sensitization programs can help combat social stigma and discrimination in vocational education, promoting inclusivity and support for all children, including orphans.
- iv. Financial and Institutional Support: Public-private partnerships and CSR funding are crucial for addressing financial barriers in sustainability centers, implementing renewable energy solutions like solar panels and rainwater harvesting systems.

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