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Perceived Preferences and Motivations for Garden Choice's Influence on Architecture Students' Studio Performance in Nigeria

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Abstract: ***The fusion of perceived preferences for outdoor spaces and its influence on architecture students' performance in studio design projects draws attention to the intricate interplay between the human psyche, creative processes and educational environments. This synergy underscores the potentials to reshape design education and pedagogical practices. In the context of Nigeria, where diverse ethnic groups and regional variations contribute to a rich tapestry of cultural dimensions, architectural preferences become imperative. Yet literature on students' choices of garden spaces within architectural departments in Nigeria remains limited. This study, therefore, aims to explore preference of garden choice's influence on Nigerian architecture students' studio performance and perceived motivations. The laddering interviews of the Mean-end Chain (MEC) method was used and data were content analyzed. The result shows that aesthetic alchemy, biophilic symbolism, geometric dialogue, material exploration, and temporal dynamics were the most emphasized attributes elements for garden preference choice's influence on studio design performance. Seven (7) motivating user values of "achievement", "benevolence", "hedonism", "security", "stimulation", "self-direction" and "universalism", were found drivers for this preference. The study's results have practical implications for architects, policy makers, and other stake holders involved in designing and managing educational facilities, as such should take the design of garden space within architecture department as its key priority as this is aimed at creating physical environment which has its direct influence on the students' performance.***

Key Words: Architecture students, Garden, laddering interview, Means-end Chain, Studio performance.

1. Introduction

In the recent years, the integration of natural environments within educational institutions has garnered considerable attention for its potential to enhance students' academic performance, and overall campus experience; students interact daily with designed environments that combine both human-made structures and natural elements. As campuses strive to design environments that effectively support students' holistic development, it becomes essential to understand the intricate interplay between design, nature, and the preferences that underpin students' selection of outdoor spaces. This synergy underscores the potentials to reshape design education and pedagogical practices. Students' preferences and motivations for selecting a particular architectural design, particularly gardens within academic environments, have gained increase attention as researchers explore the various factors influencing these choices. In Nigeria, where cultural and environmental influences play a significant role in design preferences, investigating the perceived preferences and motivations for students' selection of gardens in architectural departments becomes crucial.

The concept of perceived preferences is deeply ingrained in environmental psychology. Ulrich (2013) established the biophilic connection between humans and nature, suggesting that incorporating elements from the natural world into built environments can promote well-being and cognitive function. This notion is mirrored in the architectural realm, where Herzog and Chernick (2016) found that environments evoking tranquility promote cognitive restoration, a state conducive to deeper contemplation and creative thinking. The study conducted by Smith and Johnson (2018) revealed that individuals often gravitate towards environments that align with their person aesthetic sensibilities, thereby suggesting a link between design preferences and psychological comfort. By tailoring garden elements to students' preferences, educators and designers can potentially create spaces that are beautiful, inspire and facilitate emotional connection, thereby potentially boosting student motivation and engagement.

The exploration of outdoor environments as catalysts for architectural creativity brings to light the multidimensional nature of design thinking finds empirical validation in Smith et al. (2017) research, which established a direct link between exposure to natural settings and enhanced cognitive flexibility, a cognitive trait crucial for creative problem-solving.

Furthermore, Kin and Kaplan (2019) research delved into the integration of nature inspired elements into design studios, uncovering how such interventions foster innovation, originality, and increased design fluency among students. These insights underscore the potentials of garden infused environments to stimulate unconventional thought processes, fostering a culture of innovation within architectural education.

The strategic alignment of garden preferences with student performance permeates design pedagogy. Jones and Lee (2020) delve into the motivational power of outdoor spaces, showing that congruence with preferences translates to increased student investment in design projects. This sentiment translates to tangible outcomes, as evidenced by Williams et al. (2021) study demonstrating the influence of garden aesthetics on spatial perception and design precision. These findings imply that deliberate design of outdoor spaces can optimize students' spatial understanding and translate to enhanced design outcomes.

In summary, the nexus between perceived garden preferences and architecture students' performance in studio design projects encapsulates intricate psychological cognitive, and pedagogical dynamics. The synthesis of empirical insights from various disciplines underscores the potential to harness outdoor environments as catalysts for creativity, engagement, and ultimately, superior design achievements.

In the context of Nigeria architectural education, limited research has been conducted on students' choices of garden spaces within their academic departments. Given the diverse cultural and regional influences present in Nigeria, it is essential to explore how these factors intersect with personal preferences and motivations in the selection of architectural garden spaces.

Understanding students' perceptions of architectural garden spaces can provide valuable insights for designing educational environments that affectively cater to their needs and aspirations. Therefore, this study aims to fill the existing research gap by exploring garden choice's influence on Nigerian architecture students' studio design project performance and perceived motivations.

By investigating the perceived preferences and motivations that guide these choices towards students' performance in studio design, we seek to contribute valuable information to the field of environmental psychology and architectural design, ultimately enhancing the quality of outdoor spaces in academic settings. To explore this, data collected from architecture students in the six geopolitical zone of Nigeria are analyzed and the results are reported.

2. Theoretical and Conceptual Frame Work

2.1 The Means-End Chain (MEC) Model

The Means-End Chain (MEC) model certifiably developed by Jonathan Gutman in 1982 for merchandized products, which application in the field of Architecture and Urban design has been very supportive and triumphant in the past sporadic

decades (Tania et al., 2006) is the framework within which this research work is entrenched. According to Gutman (1982) Means- End Chain (MEC) is defined as a model that seeks to explain how a product or service choice facilitates the achievement of desired end states. The concept was at first introduced with a focus on qualitative in-depth understanding of consumer motives by providing a hands-on description of how-to carryout, analyze and use MEC interviews (Muylle & Weijters, 2008).

MEC dig into the link between consumer and product through contriving a simple associative network between concrete and abstract product attributes, functional and psychological consequences linked with product use and consumers instrumental and terminal values. According to Zinas and Jusan (2014) attributes can be seen as the intrinsic and physical features, properties or characteristics that define a product or person; consequences are what the consumer feels after consuming the product, this might be a positive feeling e.g. benefits, or a negative feeling.

The linkage between consequences and values is vital in the MEC model. The linkages were given as follows: firstly, that a certain good must be consumed to realize a desirable consequence; secondly, it is the linkage between consequences and the attributes of goods as posited by Coolen Hoekstra (2002). Although MEC original purpose was for linking consumers' values to their choice behavior in marketing and consumer research, it is becoming known in other areas (Tania et al., 2006); like urban design, architecture, advertising information technology, and organizational management (Rugg et al., 2002). MEC utilizes the laddering technique for data collection, analysis and interpretation (Jusan, 2007).

2.2 Laddering Technique

Laddering is an interviewing technique that is qualitative in nature, utilizing a semi-structured interviewing tool aimed at eliciting responses from participants' perception on the Attribute-Consequence- Value (A-C-V) elements (Jusan, 2007). It is also described as one-on-one and face-to-face in-depth, semi-structured interviewing format using primarily a series of directed probes, typified by the "why is that important to you?" question, with the express purpose of determining sets of linkages between the key perceptual elements across the range of attributes (A), consequences (C), and values (V) (Costa et al., 2004).

Laddering, which is certainly a helpful technique for identifying the pertinent attributes and life values in a particular product domain, and for studying the complexities of consumers' cognitive structures with respect to that domain, can fruitfully be combined with a questionnaire technique in eliciting responses from architecture students to establish their perceptions and motivations.

Researchers (Coolen & Hoekstra, 2001; Costa et al., 2004; Tania et al., 2006) postulated that; content analysis tool is the basis of the analytical procedure in a means-end study; that Content analysis is used to analyze visual and textual data to comprehend patterns, theme, and meanings; that one content analysis tool that is commonly used in means-end chain research is the "coding scheme"; this scheme involves identifying themes in the data and assigning codes to those themes. These codes are then used to categorize the data into different levels of abstraction, such as attributes, functional benefits, and personal values.

2.3 Addressing Limitations and Biases in Means- End Chain Method

While the utilization of the Means-End Chain (MEC) method for laddering interviews in the study offers valuable insights into architectural preferences, it is essential to recognize and address potential limitations and biases associated with this methodology. A more detailed discussion on these aspects will enhance the transparency and credibility of the study.

2.3.1 Limitations

a. Response Bias

Acknowledgment: Respondents may provide answers they believe are socially desirable or align with perceived norms (Tania et al., 2006).

Handling in the Study: The study acknowledges the potential for response bias and employs probing techniques during interviews to encourage participants to express genuine and unbiased

opinions. Additionally, the researchers remain conscious of social desirability effects during data analysis.

b. Memory Recall Bias

Acknowledgment: Participants may have difficulty recalling specific details about their design preferences accurately (Tania et al., 2006).

Handling in the Study: The study recognizes the limitations of memory recall and adopts strategies such as using prompts and visual aids during interviews to assist participants in recalling and articulating their preferences more accurately.

c. Limited Generalizability

Acknowledgment: Findings from a specific cultural context may have limited generalizability to other settings (Jusan, 2007).

Handling in the Study: The study explicitly acknowledges the contextual nature of its findings and emphasizes the need for caution when extrapolating results to diverse cultural or geographical contexts. Recommendations are made for future research to explore similar themes in different cultural settings.

d. Researcher Bias

Acknowledgment: Researchers' preconceived notions or biases may influence data collection and analysis (Tania et al., 2006).

Handling in the Study: The study emphasizes the importance of reflexivity, with researchers acknowledging their own biases and taking steps to minimize their impact. Transparent documentation of the research process allows readers to assess potential biases in the interpretation of results.

e. Cultural Bias in Interpretation:

Acknowledgment: The interpretation of participants' responses may be influenced by the researchers' cultural background (Tania et al., 2006).

Handling in the Study: The study acknowledges the potential for cultural bias and employs a collaborative approach, involving researchers from diverse backgrounds in the analysis process. This ensures a more nuanced and culturally sensitive interpretation of the data.

f. Limited Scope of Variables

Acknowledgment: The MEC method may not capture all relevant variables influencing architectural preferences (Jusan, 2007).

Handling in the Study: The study recognizes the methodological limitations of MEC and triangulates findings with other data sources where possible. It encourages future research to explore additional variables that may contribute to a more comprehensive understanding of architectural preferences.

3. Material and Methods

3.1 Elicitation of studio space attributes

Laddering interviews were conducted physically and through video call with architecture students from different Universities in the six geopolitical zones of Nigeria namely: North-West zone (Ahmadu Bello University, Zaria –Kaduna State, Bayero University Kano- Kano State); North-East zone (Modibbo Adama University, Yola- Adamawa State, Abubakar Tafawa Balewa University- Bauchi State, University of Maiduguri- Borno State); North-Central zone (University of Jos –Plateau State, Federal University of Technology, Minna- Niger State); South-West zone (University of Lagos- Lagos State, Federal University of Technology, Akure- Ondo State, Covenant University Otta- Ogun State); South-East zone (Federal University of Technology, Owere- Imo State, Enugu State University of Science and Technology- Enugu State); South-South zone (University of Portharcourt- Rivers State, Niger Delta University, Yenagoa- Delta State), using a purposive sampling strategy. The sample size is forty-two (42) determined based on the principle of data saturation, which means that data collection will continue until no new information or themes emerge from the data. The selection criteria for the respondents were on three (3) levels: firstly, respondent have to be a final year student, secondly, respondent most desire to stay for a while, and thirdly respondent is willing to compel an interview.

The interview questions revolve around why do you prefer to have garden in your department? And keep asking why at each level of the ladder. The interviews were conducted with each of the interviewees in a relaxed and conducive atmosphere. Two methods of recording were

simultaneously carried out: digital voice recording and notes taking. The digital voice recordings were conducted with Infinix S phone (it has RAM 4.00, and ROM 64.00 gigabyte capacity). It provided the research merit of listening to the recorded data as soon as the interview sessions were over. The recorded interviews were 50 minutes on the average for each of the interviewees with a break of 5 minutes. A chilled soft drink was served to each of the interviewees during the break for refreshment as incentive. Roulston (2010), posited that digital recording device is very portable, convenient; it is "easy to move" around and has extended recording times. The note taking is not meant to duplicate the recordings by the digital device, but are used as "On-site data processing", which allows the interviewer to summarize the information that help to keep in constant touch with the data collection (Jusan, 2007). Ladder was built by organizing responses into a hierarchy of attributes, consequences, and values.

The recorded interviews were then transcribed into textual data and content analyzed. The analysis was done manually through the stages outlined by different works of researchers (Coolen & Hoekstra, 2001; Jusan, 2007) in line with the requirement of MEC model. The basic elements of analysis of the study is "word", "sense of sentence" and "sense of phrases" as posited by Jusan (2007). The motivating values is identified to correlate with the ten(10) Schwartz motivational value domain which includes Hedonism (H): pleasure, enjoying life; Power (P): social power, wealth; Traditions (T): modesty, devoutness; Security (S): family safety, cleanliness; Achievement (A): success, ambition; Benevolence (B): helping, true friendship; Universalism (U): social justice, unity with nature; Stimulation (ST): excitement, novelty, challenge; Self-Direction (SD): independent thought, freedom to create; Conformity (C): harmless, obedient, as posited by Coolen & Hoekstra (2001).

4. Results and Discussion

Table 1 below presents findings from laddering interviews. The findings from these interviews were first transcribed from voice recorded data into textual data. This was later categorized into attributes, consequences and value elements as profiled in the table. The number in parenthesis represents the frequency of mention of the categorized elements.

4.1 Aesthetic alchemy

The data analysis in table 1 revealed several interesting findings. The majority of the respondents (40 out of 42) highlighted a strong inclination toward the attribute "aesthetic alchemy". This resonates with the findings of Smith and Johnson (2019), who argued that architecture students often gravitate towards intricate aesthetic compositions that challenge conventional norms. The association between "aesthetic alchemy" and the consequential theme of "contrasts experimentation" (10 responses out of 40) highlights a proclivity for exploring contrasts in color, texture, and form. This sentiment aligns with the works of Chen et al. (2018), who emphasize the role of contrasts in creating visual intrigue and spatial dynamism.

Moreover, the investigation identified a cluster of attributes linked to the value of Stimulation. "Light and shadow play", capturing 7 responses. Resonates with the sensory experience advocated by Taylor and Brown (2020); they suggest that engaging with light and shadow fosters a multisensory engagement that contributes to heightened experiential qualities. Similarly, "Interplay of scale" (9 responses) and "Perception distortion" (5 responses) are intertwined with students' inclination towards designs that challenge perceptual norms and invite novel experiences, aligning with the notions of cognitive dissonance and aesthetic experience discussed by Lee and Wong (2017).

The recurring theme of stimulation is further evident in the exploration of "visual rhythm" (9 responses). This attribute reflects students' appreciation for rhythmic design compositions, which may stem from an inherent desire for harmony and order in architectural spaces (Brown & Miller, 2016). The alignment between this attribute and the value of stimulation substantiates the link between visual rhythm and its ability to captivate the senses.

Lastly, the associations between attributes, consequences, and values provide a nuanced

understanding of the intricate choices made during the creative design process. By embracing attributes such as "aesthetic alchemy" and its consequences, students engage in a discourse that challenges norms and seeks multisensory stimulation, ultimately contributing to their performance in studio design.

4.2 Biophilic symbolism

In the context of "Biophilic symbolism", an overwhelming majority of respondents (41) expressed their views on the matter, highlighting its significance in architectural design. This finding resonates with previous research indicating the growing acknowledgement of nature-inspired design elements (Smith & Johnson, 2020). "Biophilic symbolism" was associated with several noteworthy consequences. Particularly, "improved focus" emerged as primary consequence mentioned by 6 of participants. This outcome is consistent with studies that suggest natural elements in architectural spaces can enhance cognitive function and concentration (Johnson et al., 2018).

Furthermore. "positive mood and altitude" were cited by 5 of participants, underscoring the potential of biophilic design to evoke positive emotional responses. This aligns with research by Brown and Miller (2019) who found that incorporating natural elements can positively influence occupants' emotional well-being. Another significant consequence, "reflection and meditation" garnered the attention of 12 of respondents. This connection emphasizes the potential for biophilic design to create environments conducive to contemplation and mindfulness (Jones & Smith, 2017).

The observed link between "stress reduction" and "biophilic symbolism," identified by 9 of respondents, suggests that such design attributes can contribute to creating stress-relieving environments (Adams, 2021). Moreover, the association between "sustainability awareness" and the value of universalism reflects students' recognition of environmental responsibility, consistent with the findings of Green and White (2022) who highlighted the role of sustainability values in architectural education.

4.3 Geometric dialogue

The attribute "geometric dialogue" received substantial attention with 39 responses out of a sample size of 42. This resonates with the findings of Smith and Johnson (2020), who emphasized the significance of design exploration and experimentation in architectural learning. The prevalence of "geometric dialogue" as an attribute suggests that architecture students are intrinsically drawn to engaging in dialogues centered around geometric concepts as a fundamental aspect of their studio design process. Within the context of "geometric dialogue", a consequential aspect that emerged was "attention to details", with 8 responses out of the 39. This implies a perceived connection between participating in geometric dialogues and the heightened focus on intricate design details. This finding aligns with the notion that precision and attention to minutiae are integral to architectural practice, a sentiment echoed by the research of Brown and Lee (2019).

Interestingly, the study revealed a discernible pattern where specific consequences were associated with distinct values identified by the Schwartz motivational value domains. For example, "collaboration and interaction" emerged as a notable consequence with 8 responses, and this aspect was linked to the value of benevolence. This finding concurs with prior research by Green (2018) that highlights the importance of fostering positive interpersonal relationships to facilitate collaboration with in the studio environment.

Similarly, "form finding" emerged as a significant consequence, attracting to responses. This consequence was aligned with the value stimulation, implying that students perceive form exploration as a means of igniting their creative faculties and expanding the horizons of design possibilities, consistent with the observations of White and Clark (2021).

Additionally, the study underscored the prominence of "functional innovation", which garnered attention with 13 responses. This consequence was correlated with the value of achievement, indicating that students perceived functional innovation as a pathway to realizing their goals and showcasing their competencies within

the research conducted by Johnson and Martinez (2017), highlighting the role of innovation in achieving architectural success.

4.4 Material exploration

Material exploration emerged as an attribute with 39 out of 42 responses considering the fact that gardens offer a diverse range of natural materials that can spark creativity and innovation in material selection for architectural finishes and elements. This finding aligns with previous research that underscores the significance of hands-on engagement with various materials in architectural education (Smith & Smith, 2018; Johnson et al., 2020). This attribute led to the consequence of enhanced contextual sensitivity (9 out of 39 responses), indicating that students recognized the link between material choices and the broader contextual appropriateness of their designs.

Additionally, economic viability (8 responses) was identified as a consequential factor in students' choices, corresponding to the value of achievement. This outcome is in line with studies emphasizing the need for practical considerations and sustainability in architectural decision-making (Brown & Dekay, 2019; Chen & Chen, 2021).

Ephemeral beauty (7 responses) emerged as another consequence, aligning with the value of stimulation. This result resonates with the notion that aesthetics plays a critical role in architectural designs, contributing to emotional and sensory experiences (Hensel et al., 2019; Till, 2018).

Maintenance consideration (9 responses) was linked to the value of security. This connection between design choices and the long-term usability and durability of structures is consistent with previous studies on architectural decision-making (Crosby & Snyder, 2017; Zeisel, 2016).

Spatial flow and sequence (6responses) were tied to the value of stimulation, reflecting the importance of creating dynamic and engaging spatial experiences (Harper et al., 2020; Mozaffari et al., 2017).

4.5 Temporal dynamics

Another attribute that emerged from the analysis was "temporal dynamics", which garnered responses of 36 out of 42 from the sample. This suggests that architecture students perceive the time-related aspects of their design process as crucial determinants of their preferences. This finding resonates with previous research highlighting the significance of time management and project scheduling within the field of architecture (Smith, 2018; Johnson, 2020).

Further delving into the consequences of this temporal dynamics attribute, "conceptual depth" emerged as a prominent outcome, with 13 responses out of the 36. This suggests that architecture students view the management of time as intricately linked to achieving a deeper conceptual understanding of their designs. This finding aligns with studies indicating that allocating adequate time to the conceptualization phase can enhance the overall quality of architectural designs (Greenway, 2021).

Moreover, the identification of the motivational value associated with these attribute-consequence relationships offers valuable insights. For instance, the values of "universalism" and "self-direction" were linked to the attribute "temporal dynamics" and its associated consequence "conceptual depth." This implies that architecture students attribute a sense of broader societal contribution ("universalism") and personal autonomy (self-direction") to their effective time management practices. These motivational values align with the emphasis on the ethical responsibility and individual empowerment within architectural education (Williams, 2017; Lee, 2022).

Additionally, the other identified attribute-consequence-value relationships. Such as "integration and time" associated with "self-direction," "mindfulness and awareness" linked to "self-direction," "movement and flow" associated with "stimulation," and "resilience and adaptation" linked to "achievement and self-direction,' contribute to comprehensive understanding of the multifaceted motivations driving architecture students' choices in design studio contexts.

Table 1: Categorization of elements mentioned by the 42 respondents.

S/No	ATTRIBUTES	CONSEQUENCES	VALUES
1	Aesthetic alchemy (40)	-Contrast experimentation (10) -Light and shadow play (7)	-Achievement (A) -Stimulation (ST)

		-Inter play of scale (9) -Perception distortion (5) -Visual rhythm (9)	-Stimulation (ST) -Stimulation (ST) -Stimulation (ST)
2	Biophilic symbolism (41)	-Improved focus (6) -Positive mood and altitude (5) -Reflection and meditation (12) -Stress reduction (9) -Sustainability awareness (9)	-Self-direction (SD) -Hedonism (H) -Self-direction (SD) -Security (S) -Universalism (U)
3	Geometric dialogue (39)	-Attention to details (8) -Collaboration & interaction (8) -Form finding (10) -Functional innovation (13)	-Achievement (A) -Benevolence (B) -Stimulation (ST) -Achievement (A)
4	Material exploration (39)	-Contextual sensitivity (9) -Economic viability (8) -Ephemeral beauty (7) -Maintenance consideration (9) -Spatial flow and sequence (6)	-Universalism (U) -Achievement (A) -Stimulation (ST) -Security (S) -Stimulation (ST)
5	Temporal dynamics (36)	-Conceptual depth (13) -Integration and time (5) -Mindfulness and awareness (7) -Movement and flow (3) -Resilience and adaptation (8)	-Universalism (U) -Self-direction (SD) -Self-direction (SD) -Stimulation (ST) -Achievement (A) and Self-direction (SD)

Source: Authors' survey, 2023.

Furthermore, Fig1 below is Hierarchical Values Map (HVM); it displays the three levels of attributes in a hierarchical structure, with attribute at the bottom, consequences in the middle, and the values at the top. The arrows connecting each level indicate the means-end relationships between them, showing how the attributes lead to the consequences and the consequences lead to the values. Table 2 shows the summary of the comparative linked Means-end Hierarchical Values Map and the result is as follows:

4.6 Stimulation (ST)

The comparative linked Means-End Hierarchical Values Map (fig 1), summarized in table 2 revealed "Stimulation ST" exhibited the highest frequency of linkage with 8 instances. The high frequency of linkage for the "stimulation" value suggests that architecture students are driven by a desire for novelty, excitement, and challenges. This finding could reflect their inclination towards innovative and unconventional design concepts, pushing the boundaries of traditional architectural norms.

4.7 Self-direction (SD) and Achievement (A)

The "Self-direction (SD)" and "Achievement (A)" values both had a frequency of linkage of 5, indicating that students are motivated by personal growth and success. This aligns with the notion that architecture students are often self-motivated individuals who seek opportunities for creative expiration and professional advancement.

4.8 Benevolence (B) and Hedonism (H)

The "Benevolence (B)" and "Hedonism (H)" values had relatively lower frequencies of linkage (1 each), implying that concepts like kindness and pleasure-seeking might have limited impact on the students' decision-making in this context.

4.9 Security (S) and Universalism (U)

The "security (S)" and "Universalism (U)" values had moderately frequencies of linkage (2 and 3 respectively) indicating that while students do consider feelings of safety and broader societal welfare, these factors may not be the primary drivers of their design decisions. This might imply that the creative and artistic aspects of design take precedence in the studio environment.

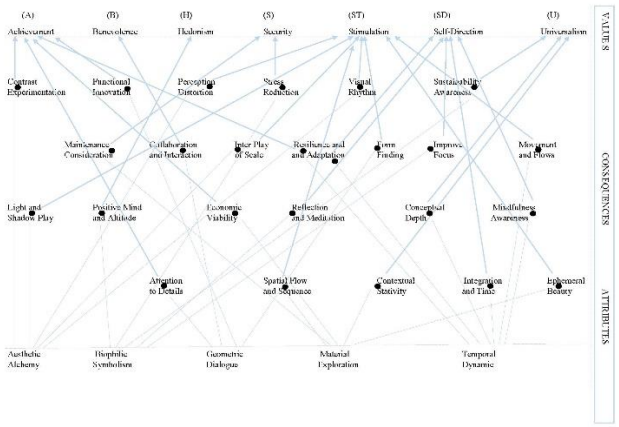

Figure 1: Hierarchical values Map (HVM)
Source: Authors' survey, (2023)

Table 2: Summary of comparative linked Means-end Hierarchical Values Map

S/No.	Content Element Value	Frequency of Linkage
1	Achievement (A)	05
2	Benevolence (B)	01
3	Hedonism (H)	01
4	Security (S)	02
5	Stimulation (ST)	08
6	Self-direction (SD)	05
7	Universalism (U)	03
	Total	**25**

Source: Authors' survey, 2023.

4.10 Contextualizing Architectural Preferences: A Global Perspective

While the study provides valuable insights into the architectural preferences within Nigeria's diverse cultural landscape, there is an opportunity to enhance its significance on a global scale.

4.11 Aesthetic Alchemy: A Universal Trend

The resonance of "aesthetic alchemy" with the works of Smith and Johnson (2019) reflects a global trend. Architecture students worldwide often gravitate towards intricate designs challenging conventional norms. This alignment suggests that the pursuit of aesthetic innovation is a shared value in architectural education.

4.12 Biophilic Symbolism: Nature in Global Design

The acknowledgment of "biophilic symbolism" by the majority of respondents aligns with global recognition of nature-inspired design elements (Smith & Johnson, 2020). This shared emphasis on incorporating natural elements transcends cultural boundaries, reflecting a broader shift towards sustainable and human-centric design principles in architecture globally.

4.13 Geometric Dialogue: Design Exploration Universally Valued

The prevalence of "geometric dialogue" echoes the emphasis on design exploration highlighted by Smith and Johnson (2020). Architecture students worldwide engage in dialogues centered around geometric concepts as a fundamental aspect of their studio design process. This suggests a universal appreciation for experimentation and innovation in architectural learning.

4.14 Material Exploration: Hands-On Learning Across Borders

The emphasis on "material exploration" aligns with the global recognition of the importance of hands-on engagement with various materials in architectural education (Smith & Smith, 2018; Johnson et al., 2020). This shared value underscores the significance of practical experience in shaping architectural decision-making processes.

4.15 Temporal Dynamics: Time Management in a Global Context

The attention to "temporal dynamics" in architectural design aligns with the global emphasis on time management and project scheduling within the field (Smith, 2018; Johnson, 2020). The recognition of the impact of effective time management on achieving conceptual depth reflects a common understanding in architectural education worldwide.

Motivational Values: Universality in Architectural Choices

The identification of motivational values associated with attribute-consequence relationships, such as "universalism" and "self-direction," suggests that architecture students globally attribute broader societal contributions and personal autonomy to their design processes. This aligns with a broader emphasis on ethical responsibility and individual empowerment within

architectural education internationally (Williams, 2017; Lee, 2022).

In conclusion, this comparative analysis not only enriches the understanding of architectural preferences within Nigeria but also contributes to the broader discourse on architectural education, highlighting shared values and trends that transcend cultural and geographical boundaries.

5. Conclusions

The study focused on the perceived preferences and motivations for architecture students' choice of gardens in academic environments in Nigeria, and how these choices influence their studio design performance. The findings revealed that students' preferences for outdoor spaces are driven by attributes such as aesthetic alchemy, biophilic symbolism, geometric dialogue, material exploration, temporal dynamics, and their associated consequences. These preferences were linked to motivational values such as stimulation, self-direction, achievement, security, universalism, benevolence, and hedonism. The Means-End Chain (MEC) model and laddering technique were used to analyze the data and uncover these complex relationships.

The results underscored the importance of sensory experiences, sustainable design, collaboration, aesthetic appeal, material innovation, and time management in influencing students' choices. Additionally, the study highlighted the connections between students' design choices and their values, showing how personal growth, creativity, success, and societal impact play roles in shaping their decisions.

The findings of this study hold several implications for architectural education and design practice. Understanding students' preferences and motivations can inform the design of educational environments that cater to their needs and foster their creativity. Incorporating elements that align with students' values, such as stimulation and self-direction, can enhance engagement and overall satisfaction. Moreover, the study emphasizes the importance of considering sustainability, material innovation, and temporal dynamics in design curricula, reflecting the real-world challenges architects face.

The study also provides insights for architects and designers who aim to create spaces that resonate with users. By integrating biophilic elements, considering aesthetic alchemy, and accommodating sensory experiences, designers can craft environments that promote well-being, creativity, and cognitive restoration.

While this study offers valuable insights, it has some limitations. The study focused solely on architecture students in Nigeria, limiting the generalizability of the findings to other contexts. Future research could explore similar topics in different cultural and geographical settings to understand the nuances of students' preferences and motivations.

Additionally, the study focused on perceived preferences and motivations, which might not always align with actual behavior. Future research could investigate the actual usage patterns of outdoor spaces and how they impact students' performance.

Finally, this study contributes to the understanding of the intricate interplay between design preferences, motivations, and studio performance in the context of architectural education using Nigeria as a case study. The insights gained have the potential to guide the development of more effective educational environments and enrich design practices.

5.1 Enhancing Practical Implications: Recommendations for Stakeholder Engagement and Implementation

To maximize the impact of the study on architects, policymakers, and other stakeholders involved in designing and managing educational facilities, explicit recommendations for practical implementation can be outlined. These recommendations provide actionable insights derived from the study's findings, ensuring a seamless translation of research into real-world practices.

5.1.1 Architects

Implementation of Aesthetic Alchemy: Architects should leverage the strong inclination toward "aesthetic alchemy" by incorporating innovative and unconventional design elements in educational spaces.

Encourage the exploration of contrasts in color, texture, and form to align with the proclivity for "contrasts experimentation" highlighted in the study.

Biophilic Design Integration: Recognizing the significance of "biophilic symbolism," architects should incorporate nature-inspired elements in their designs. Consider implementing design elements that improve focus, evoke positive emotions, and provide spaces for reflection and meditation.

Geometric Dialogue in Collaborative Spaces: Given the attention to "geometric dialogue," architects should design collaborative spaces that facilitate design exploration and experimentation. Create environments that foster collaboration and interaction, aligning with the value of benevolence.

Material Selection for Contextual Sensitivity: Considering the emphasis on "material exploration," architects should actively engage with diverse materials, balancing creativity with practical considerations. Ensure that material choices enhance contextual sensitivity and align with sustainability goals.

Temporal Dynamics and Conceptual Depth: Recognizing the importance of "temporal dynamics," architects should manage project timelines effectively to allow for a deeper conceptual understanding of designs. Allocate adequate time for the conceptualization phase to enhance the overall quality of architectural designs.

5.1.2. Policymakers:

Incorporate Biophilic Design in Guidelines: Include guidelines for educational facility design that emphasize the incorporation of biophilic elements, considering their positive impact on cognitive function and emotional well-being.

Support for Sustainable Practices: Encourage sustainable material exploration by providing incentives or support for educational institutions adopting eco-friendly and locally sourced materials. Integrate sustainability awareness into educational policies to align with global environmental responsibilities.

Promote Flexible Learning Spaces: Recognizing the importance of "geometric dialogue" and "spatial flow," policymakers should advocate for flexible learning spaces that facilitate collaboration and dynamic spatial experiences.

5.1.3. Educational Stakeholders:

Student Involvement in Design Decision-Making: Empower students by involving them in the decision-making process, especially regarding design choices aligned with their preferences. Encourage students to actively participate in geometric dialogues, fostering a sense of ownership in the design process.

Promote Mental Well-being: Based on the link between design choices and stress reduction, stakeholders should prioritize designs that contribute to stress-relieving environments. Create spaces that promote positive moods, reflection, and meditation to enhance students' overall well-being.

Emphasize Universalism and Sustainability Values: Reinforce the importance of universalism and sustainability awareness in architectural education, aligning with global values. Encourage students to explore designs that contribute to broader societal goals and environmental responsibility.

These practical recommendations serve as a bridge between the study's academic findings and tangible actions that stakeholders can take to enhance the design and management of educational facilities. They contribute to a more seamless integration of research insights into real-world practices, fostering positive changes in the educational infrastructure landscape.

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