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CONTEXTUALIZING "DRAW IN ORDER TO SEE" FOR INNOVATIVE REFORMATION IN THE NIGERIAN SUSTAINABLE ARCHITECTURAL EDUCATION

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ABSTRACT

Purpose: There is continuous demand for improvement and sustainable innovations on architectural education globally and as such, this demand leads the discourse in all spheres of architecture. Coinciding with this demand is the requirement for sustainable practices/services within the built environment professions and the reformation of their educational training. Therefore, Nigeria cannot be an exception but to align with the global trend in order to secure a favourable future for the profession of architecture.
Design/methodology/approach: The recent 12 points/Ways identified to Reform Architectural Education by Hewitt's book titled "Draw in order to see" are adopted for this study in addition to a review of other related literature to form the theoretical underpins. Also, perceptions were collated through hard copy questionnaire and monkey online survey amongst architects within Nigeria in December 2020. A total of 129 responded but only 123 completed the survey questions.
Findings: Their responses are presented with the aim to validate and contextualize findings to the Nigerian context. Findings suggest that history, site visits, collaborations and abstract critical thinking remain very relevant. Whilst virtual representations of designed environment are opined to be necessary to the architectural education in the Nigerian context.
Originality/value: This study's conclusion and recommendations were drawn with the aim provides insights towards the reformation in the Nigerian architectural education. These includes; harmonizing the design/studio practices across all schools of architecture, mandatory sites visit at all level of architectural training, maintain traditional and modern architectural studies, promote contacts and collaborations between students and with artisans, manufacturers and tradespeople.

Keywords: Architectural education; improved design innovation; Nigeria; sustainability.

1. INTRODUCTION

The book, "Draw in Order to See: A Cognitive History of Architectural Design" has 300 pages and the subject matter is aimed at reforming architectural design education

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through history. Over 12,000 years' period in the history of architectural design was surveyed by the author – Martin Alan Hewitt. This he did in order to draw out specific information and schemes used in architectural design by humans to build houses and other structures. His historical findings divide the design thought into three cognitive areas; crafting, depicting and assembling.

The book is structures into chapters, from depictions during the Renaissance, the education of architects in the modern era, Baroque illusionism and scenography, the breakdown of artisanal literacy during the enlightenment, modern experiments with models, montage, and to illusions of movement. Although a book, the author's presentation of the chapters made it possible to read each chapter as stand-alone and such contributions in text are observed to make it easy for specific conservations with each grapple with different approaches, concepts, problems, and themes therein (Lock, 2016).

Furthermore, the author gave some highlights on the way forward to address the concerns for the reformation of architectural education amid the global challenges for sustainable innovations in the design of structures and design education (Chance et al., 2016). In conclusion, the author critiques the contemporary architectural design education deducing from the trends and experiences covering the 12,000 years' period covered by the book.

In the overall, the book 'Draw in Order to See: A Cognitive History of Architectural Design' is relatively new but it has been noted to bridge the gap and concern for a sustainable architectural education (ArchDaily, 2020). This concern has also been expressed by the Nigerian Institute of Architects (NIA) 60th Annual General Meeting and Conference (AGM 2020), particularly in the Pedagogy (Architectural Education) sub-theme as captured in the NIA, AGM 2020 Poster.

This study is limited to the architectural design education reformation uncovered for the western economies. A quantitative inquiry is employed to gauge the opinions from the Nigerian context perspective. The reformations highlighted therein, in the book are documented into 12 points/ways, which underscore this study's discourse and are supported by other underpins from literature and the AGM 2020 concerns for; "sustainable development, city configurations, demographics etc., as well as establishing ways of keeping the profession relevant in the ever expanding array of professional disciplines within the built environment" (NIA, AGM 2020 Poster p.1).

This background forms the justification for this study, and hence the review of the 12 points/ways to reform architectural education as a spring board that would promote and make the Nigerian architectural education and profession relevant amidst the continuous challenges in the built environment disciples to prosper sustainably.

2. REVIEW OF RELATED LITERATURE

The proposed 12 Points/Ways to Reform Architectural Education:

1. **Go back to the hand-drawn sketch as the fundamental medium and tool for creating architecture**. *Hand drawing is a must, not only for practicing architects (many of whom have never stopped doing it), but for the most technologically oriented students. The daily or weekly practice of drawing strengthens neural networks and engages cognitive faculties at many levels, just as playing scales and other keyboard exercises keeps musicians sharp. Students should sketch from the very beginning of their education and be required to use sketches to document and develop their visual ideas (Hewitt, 2020).*

This position put forward by Hewitt (2020) resonates with other design researchers, who also suggests the importance of hand drawing despite the technological made-easy design tools readily available to architectural design professionals. Hand sketching or drawing is considered to be a universal skill and it allows design students to try out ideas, imaginations, access abstract thinking and also putting a pen to paper has great benefits in learning, processing and retention of ideas (Torem, 2017). Additionally, free hand drawing has a way of simplifying complex information to just the essentials, helping ideas like pattern, composition, relationship to emerge with just a few hand sketches, which tell a better story of the design process (Torem, 2017). Furthermore, Torem, (2017) asserts that hand drawing makes the designer have an intimate and emotional connection between existential being and the surrounding world. Whilst in recent decades, the useful invention of architectural software has fundamentally changed the look and the mental connection of new construction, and minimizes interactions and collaborations (Torem, 2017; Moses, 2019). The relevance on just the technological architectural stools becomes a disadvantage it is solely used in the design of buildings.

2. **Make every effort to see new places and to visit outstanding buildings, landscapes, and urban ensembles as often as possible**. *Rather than only using a camera or a cell phone, record experiences in a sketchbook via images with words attached. Travel abroad as often as is practicable, to extend the breadth of direct experience with the spaces and places that have inspired predecessors through the centuries. Architecture programs can learn valuable lessons from Notre Dame, which requires all of its third-year students to study in Rome* (Hewitt, 2020).

Hewitt (2020) suggests that travel is part of architectural education for meaningful application of experiences, mental connection with history and to draw lessons from the past. Suneja (2018) opined that travel enables the architectural student to explore and to understand transition of designed spaces and the environment (Ebohon et al., 2013; Allu, 2014). The travel architecture explains why architecture goes way beyond aesthetics into comfort determined climatic conditions of a place and what determines the uniqueness of parts of a building. It is also important for the student to understand the intricacies of any building or structure, which might easily get overlooked when explored through a video or some photographs (Suneja (2018). Thus, traveling is much more than a mare experience but a process of the timelessness of architecture of the past, the present and the future.

3. Make architectural history a requirement in all design programs, and avoid the pitfall of presenting only modern architecture. *Beginning these courses in the 18th or 19th century is as inexcusable today as failing to present non-Western buildings, cultures and artifacts. It is also useful to teach young architects the proportional and grammatical systems associated with classical architecture, Chinese traditional architecture, and other non-Western systems, which may soon prove to be linked to schemata in the brain (Hewitt, 2020).*

In architectural education the history of architecture traces the trends, changes, challenges in architecture through different traditions, regions, culture, overarching stylistic trends, climates and dates. As such, the importance of making the study of architectural are many to include; learning for knowledge and avoiding past mistakes (Craven, 2020), integrating sustainable solution and options (Allu, 2014a), the intentions that distinct the different architecture due cultural difference, climate, location and systems (Avila, 2018) and establishing interconnectivity between various traditional architecture (Sagdic and Kosova, 2013). In architecture, the memory of the past is needed to figure out the present (Kasapi, 2018). This has been reflected in Figures 1a, 1b and 1c showing that there is a

connect between old buildings and new buildings in their design requirements and architectural form.



Figure 1a: Temple of Artemis, Corfu Greek Temple (Built 580 BC).
Source: Adhikar (2019).



Figure 1b: *Palladian villa of the Veneto* by *Andrea Palladio was an Italian Renaissance architect. Source: https://www.google.com/search?q=Palladian+villas+of+the+Veneto&client=firefox-b-ab&sa=X&stick=H4sIAAAAAAAAAONgecRYyC3w8sc9YamMSWtOXmNM4uIKzsgvd80rySypFNLiYoO*



Figure 1c: The White House. Washington, D.C., began in 1792 occupied in 1800
Source: Craven, (2019)

4. **Require students to engage with building users as soon as possible in their studio experiences**. *Many schools now offer classes that allow students to build small projects for clients needing pro bono services. The Yale Building Project is the one of most famous of these, but most schools now bring studios to the public and engage in solving "real" problems for those in need. Drawings are limited in their capacity to inform students about space and materiality. Only by experiencing the construction of buildings can they grasp the fundamental tectonic qualities of their art* (Hewitt, 2020).

This fourth point by Hewitt to engage users has been emphasized by many researchers globally (Sani et al., 2011; Zubairu, 2012; Allu, 2014a; Osei-Kyei and Chan, 2017). These

researchers suggest that, students should be engaged with design projects that would allow them to engage with users in order to provide functional and useable spaces.

5. **Maintain regular contact with tradespeople, artisans, and makers of building components and materials.** *The modern continuing education system in the U.S. provides many opportunities for such contact, but longer workshops with master artisans are always more meaningful than distance education or online courses. At the university level, maintain workshops in the architecture program or in allied engineering and material science departments, and make certain that all students are exposed to their projects and processes* (Hewitt, 2020).

On one hand, the use of workshops is not uncommon to the Nigerian architectural educational context and should be encouraged to continue and improved upon. On the other hand, the contact between students and artisans, tradespeople and manufacturers is seemingly not satisfactorily established (Allu, 2018). Whilst in other developed economies such contacts are embedded in the education of built environment professionals (Pour, et al., 2014; Iyer-Raniga and Andamon, 2016) to enhance sustainable innovations. Therefore, developing economies like Nigeria cannot afford to miss out in this sustainable innovation drive.

6. **Balance linguistic and theoretical dialogue with purely visual and haptic means of presenting architectural ideas**. *The field has drifted too far into modes of thinking that pull the curtain over the visual brain, literally preventing designers from engaging with the essential qualities of environments, spaces, and type forms. Though all architects must understand the power of physical forms to convey symbolic meaning, focusing mainly on semantic knowledge has led us away from the core concerns of our discipline* (Hewitt, 2020).

Balancing holistic requirements which includes, aesthetics, appearance, comfort, lifestyle, mental and physical health are important for a sustainable building design. The importance of this balancing these requirements in design is an important factor of architectural design education, particularly in the times of an unexpected pandemic (Xu, 2020). The act of balancing mental and physical health with other design requirements are necessary for a holistic and sustainable design output, particularly at such a time as the current covid-19 pandemic.

7. **Integrate analog and digital tools in the design studio, as Pixar does in its film production. No designer can afford to throw away powerful computers and software when they improve accuracy and productivity in so many areas**. *However, there is no reason why much basic design cannot be done with traditional drawings and models, nor is it necessary to ignore low-tech and artisanal processes when considering how to make buildings more beautiful and durable*. (Hewitt, 2020).

Integrating all design concerns into the different processes of the traditional and contemporary design would produce a holistic approach to adopted design options in architectural education. According to Yildirum and Yavuz (2012) in their study on comparison of traditional and digital visualization technologies in architectural design education, concluded that conventional tools are still relevant and digital technologies are necessary and therefore, hybrid architectural educations is the way to go as transition until such a time that the traditional educational method is inevitable.

Khodeir and Nessim (2019) in their study on architectural education and employability concluded that, two and three dimensional drawings are still very relevant but also assert that digital tools may be maintained as additional tools for visuals in design education. Similarly, Becerik-Gerber et al. (2011) observed and notes that there are disparities in educational programs using different technological tools, which needs to be realigned to harmonize and to develop the workforce of the future for improved sustainable architectural

education. In Nigeria, the onus for such harmonisation is with the professional institutes and government regulators.

8. **Avoid all forms of virtual representations of designed environments until the presentation stage of design**. *Research suggests that these "worlds" distort and misconstrue the nature of the spaces and forms they are meant to convey. As software engineers develop more accurate means of representing buildings and natural environments, adopt these means cautiously. Tablets have not yet matched the flexibility and expressive capacity of paints, inks, pencils, and charcoal on paper* (Hewitt, 2020).

Pure flexible creativity is an in-built talent which must be expressed before such imaginations are allowed to be aided or distorted by external influences. The reason for this stipulation is that lack of imagination stunt creativity. Memory and Imagination in Architecture informs the creative processes (Kasapi, 2018). Shuaib, (2018) argued that, creative thinking skills using a cognitive-based creativity in architectural education must be pursued sustainably. This is obvious in many schools of architecture in Nigeria, where 'theory of creative thinking' is taught and must be continued. As important as architectural presentation software is, it is better introduced after the design concert process is actualized, thereafter, design software can be used as support tools during presentations. In addition, sustainability must be enshrined into creative thinking to ascertain the sustainable design options are considered, so as not to distort the natural spaces and health concerns for the sake of aesthetics (Allu, 2016 and 2018).

9. **Employ digital drafting platforms as adjuncts to hand drawing, using these tools the same way architects used hard line drawings during the 19th and 20th centuries**: *as means of accurately conveying construction plans, sections, elevations, and details. Avoid "smart" software such as Revit, which layers and attaches proprietary products to the design process before creative decisions can be objectively rendered* (Hewitt, 2020).

An earlier study by Shuiab (2018), viewed problem-solving activity beyond the traditional process of solving problems in cognitive psychology and further states that, creative thinking skills that employ visual, verbal expressions and cognitive rationale are necessary. Although, there are evidence suggesting that visual expressions are considered to be non-rational way of learning and are thus, rarely pursued in design education (Shuiab, 2018). Digital platforms are encouraged to be used as a means for actualizing visual expression and not as the means in themselves.

10. **In the academy, employ research professors in areas of bona fide applicability to the task of building.** *Demand evidence-based, peer-reviewed research products. Remove such nonprofessional faculty from the studio and employ only practicing architects at all levels of design instruction (Hewitt, 2020).*

Emam et al. (2019) deduced from their study on collaborative pedagogy in architectural design studio, opined that, participatory design studio with experienced instructors who are knowledgeable in architectural in specific area of practice help to develop better students' skills. Whilst, Allu (2018) also argues that industry based professionals' participation in the education of built environment professionals promotes collaborations for the present and the future. The professional and student collaborative design thoughts and applications also serves as an architectural mentoring process (Allu, 2015).

11. **Teach basic drawing with constant reference to the most recent research in cognitive science and visual perception**. *Engage with direct experience as well as with mnemonic models and schemata, and use references from well-known visual artists and artworks (Hewitt, 2020).*

In architectural education, theory must always connect with the environment and its sustainability and relate same to the position of the perceiver or user. This interconnectivity has been noted and documented in earlier studies (Kubory et al., 2013; Allu, 2014) which

must be updated regularly through more current findings. Therefore, architectural design educators must ensure to engage in continuous professional development and be open to new innovations in their specific research areas for self-development and to transfer the knowledge to today's student for future applications.

12. **Emphasize the collaborative nature of design as a discipline, and foster collaboration in the studio curriculum rather than emphasizing individual "innovation" as a criterion for architecture.** *Encourage students to work in teams and provide opportunities to do so, despite the difficulty of assessing individual contributions during the grading process. These simple measures, even if implemented first on a small scale in design communities or individual schools, will provide positive proof of the benefits of a design practice based upon embodied cognition rather than purportedly rational or conceptual thinking. The results will be immediately evident in more beautiful, commodious, and healthy environments (Hewitt, 2020).*

On collaboration in the architectural educational domain, Idi et al. (2018) reported that many researchers and design educators perceive collaboration as individual designers collaborating with allied professionals mainly, playing down the student-to-student collaboration in studio design activities. Meanwhile, other studies also suggest that student collaborations are advantageous for many reasons to includes; provide equal opportunity for contributions, collective approach to design solutions which are provide holistic because of the different inputs by each of the students (Allu, 2013 and 2016). In the overall, students' collaboration allows designated task for each of the student designers to perform within key cognitive design requirements, such as, linking functional relationships, structural considerations, frame, movements, evaluation, abduction, analysis, induction, deduction and other design considerations (Allu, 2016; Idi et al., 2018).

Following the theoretical discourse, this study sought the opinions of architects and particularly from the architectural educators' opinions in regards to the 12 ways to Reform Architectural Education. For a couple of reasons; for contextualizing findings, to ascertain areas of commonality, to uncover areas of reformation and to buttress areas to be maintained or improved upon the Nigerian architectural education.

3. RESEARCH METHODOLOGY

In this study, a questionnaire research survey was adopted. A combination of monkey survey through an online link and hardcopy questionnaires were provided to architects across the country who are in education and or in architectural practice. Only completed questionnaires were used for the study, which were 123 out of the 129 respondents who responded to all questions in the questionnaire survey, representing 95% response rate.

The study sought to validate the degree of agreement with the 12 points statements proposed by Hewitt (2020) and to deduce the Nigerian peculiarity and thus contextualized the perceptions of the respondents accordingly. A five-point Likert scale was adopted to the responses as: 1 = Not Important (NI), 2 = Somehow Important (SI), 3 = Fairly Important (FI), 4 = Definitely Important (DI) and 5 = Very Important (VI). For data analysis a simple per cent were used to present the degree of importance of the proposed points as statements. A simple statistical metrics of numbers and percentages derived directly from the Excel Spreadsheet was used. This was explored to achieve easy understanding and clear presentation of the results obtained, this action has been supported by Di Leonardo (2017).

4. RESULTS AND DISCUSSION OF FINDINGS

The spread of the respondents who are architects showed that, those within the range between 5 to 10 years are in the majority (50%), whilst the much older architects form about 20% of the respondents. A number of this later group indicated their preference for the hardcopy questionnaire but failed to return the filled questionnaire within the three weeks stipulated time for the survey. The 12 points statements were validated for contextualization and presented in details on Table 1.

Table 1: Showing the responses to the 12 points for architectural education transformation

SN	STATEMENTS	1(NI)	2 (FI)	3 (SI)	4 (DI)	5 (VI)
1	Go back to the hand-drawn sketch as the fundamental medium and tool for creating architecture.	16 (13%)	17 (13.8%)	29 (23.6%)	24 (19.5%)	37 (30.1%)
2	Make every effort to see new places and to visit outstanding buildings, landscapes, and urban ensembles as often as possible.	0 (0%)	0 (0%)	7 (5.7%)	33 (26.8%)	83 (67.5%)
3	Make architectural history a requirement in all design programs, and avoid the pitfall of presenting only modern architecture	0 (0%)	3 (2.4%)	21 (18.1%)	37 (30%)	62 (50.4%)
4	Require students to engage with building users as soon as possible in their studio experiences.	1 (0.8%)	3 (2.4%)	17 (13.8%)	45 (36.5%)	57 (46.3%)
5	Maintain regular contact with tradespeople, artisans, and makers of building components and materials.	0 (0%)	1 (0.8%)	18 (14.6%)	49 (39.8%)	56 (45.5%)
6	Balance linguistic and theoretical dialogue with purely visual and haptic means of presenting architectural ideas.	0 (0%)	6 (4.9%)	28 (22.8%)	56 (45.5%)	33 (26.8%)
7	Integrate analog and digital tools in the design studio, as Pixar does in its film production. No designer can afford to throw away powerful computers and software when they improve accuracy and productivity in so many areas.	2 (1.6%)	1 (0.8%)	14 (11.4%)	42 (34.1%)	64 (52%)
8	Avoid all forms of virtual representations of designed environments until the presentation stage of design.	31 (25.2 %)	24 (19.5%)	36 (29.2%)	18 (14.6%)	14 (11.4%)
9	Employ digital drafting platforms as adjuncts to hand drawing, using these tools the same way architects used hard line drawings during the 19th and 20th centuries	4 (3.2%)	8 (6.5%)	34 (27.6%)	50 (40.6%)	28 (22.7%)
10	In the academy, employ research professors in areas of bona fide applicability to the task of design studio activities.	1 (0.8%)	4 (3.2%)	19 (3.2%)	46 (37.3%)	55 (44.7%)
11	Teach basic drawing with constant reference to the most recent research in cognitive science and visual perception.	2 (1.6%)	0 (0%)	12 (9.7%)	34 (27.6%)	74 (60.1%)
12	Emphasize the collaborative nature of design as a discipline, and foster collaboration in the studio curriculum rather than emphasizing individual "innovation" as a criterion for architectural education.	0 (0%)	2 (1.6%)	18 (14.6%)	49 (39.8%)	54 (43.9%)

Responses for the **first statement**: *Go back to the hand-drawn sketch as the fundamental medium and tool for creating architecture*, recorded the following results;

A total of 87.8% were in different level of agreement with the statement, whilst 12.2% felt it was not important to go back to the hand-drawn sketch as the fundamental medium and tool for creating architecture. The results show that, hand drawing is still relevant and therefore, hand drawing is still an essential process that must be retained in the education of future architects.

The **second statement**: *Make every effort to see new places and to visit outstanding buildings, landscapes, and urban ensembles as often as possible*, was responded to with absolute agreement thus, 67.5% of the agreed that it is very important and 26.8% of the respondents agreed that it is definitely important seeing new places and visiting outstanding buildings, landscapes and other urban ensembles should be a regular activity about 5.7% felt the statement was somewhat important. In the over all, no respondents were in disagreement with the statement. Clearly, the opinion expressed is an indication that travelling to see new places and visiting outstanding buildings and other environmental structures is considered a must-do aspect of sustainable architectural education. This has been noted in the theoretical discourse and has been further validated strongly in the Nigerian context. Thus, the timelessness of architecture is further emphasised as expressed with about 100% agreement.

Responding to the **third statement**: *Make architectural history a requirement in all design programs, and avoid the pitfall of presenting only modern architecture*. There were no respondents who felt, the statement was not important and out of the 100% agreement level 62% felt the statement was very important. This result further validates the interconnect between the old and new buildings. Furthermore, this suggests that buildings in different architectural periods, developed and transformed from past history with modifications to suit the needs of the contemporary time and culture sustainably. For the **fourth statement** on whether the students in architectural training are require to *engage with building users as soon as possible in their studio experiences*. The opinion of the respondents showed that one respondent 0.8% opined that the statement was not important leaving about 99% with varied agreement level as shown in Table 1. This result supports the theoretical discourse and suggests the potential for improvement in the design of design of functional spaces.

The **fifth statement**: *Maintain regular contact with tradespeople, artisans, and makers of building components and materials,* also had different levels of agreement with no respondent in disagreement with the statement. However, about 46% are of the opinion that the statement was very important and therefore, more is expected to ensure these contacts are sustained or improved upon on this regards. The implication for this absolute level of agreement, calls for institutional decisions and policies for embedding into the architectural education curriculum this two-way contact in the Nigerian architectural schools. Therefore, aligning with the international practices for sustainable innovation in act design, practices and for the production of building materials.

Similarly, the **sixth statement** had the same varied pattern of opinion in agreement with 26.8% of the respondent who agreed that the statement on requiring a - *Balance linguistic and theoretical dialogue with purely visual and haptic means of presenting architectural ideas* is very important. This result has also validated the need for balancing design requirements with health requirement. A sustainable balanced design has the potential to contend with health related challenges like the current global corona virus pandemic.

Only two of the respondents representing 1.6% disagree with the **seventh statement** suggesting the integration of analog and digital tools in the architectural design studio. The highest agreement level on this statement was 52%, these respondents agreed that the, statement was very important to architectural education for improved productivity.

However, in the review underpins, it was suggested there is need to harmonize the design studio across schools of architecture. In the Nigerian context, the architectural education must be guided to harmonize its programmes through the Nigerian Institute of Architects (NIA), the architectural education regulator – Architects Registration Council of Nigeria (ARCON) and National Universities Commission (NUC). These are the responsible agencies in this regard and are able to harness all architectural educational programme towards sustainable technological innovation and transformation of the architecture profession.

The **eighth statement** seems to be an outlier, this is because about 25% of the respondents disagree with the statement and those in agreement were spread across four level of agreement of the importance of the statement, where only 11% felt the statement was very important. This result suggests that other forms of virtual representations are deemed necessary at the initial design conceptions within the Nigerian context. The validity of this findings does not align with findings from the secondary sources suggested that, the absent of other forms of visual forms during design conceptions distort the natural/cognitive creative thinking.

Responding to the **ninth statement**, the respondents at a total of 97% agreement whilst 4 respondents representing about 3% are of the opinion that digital drafting platforms do not serve as adjuncts to hand drawing but as means in themselves. In responding to the **tenth statement**, a total of about 99% were in agreement with about 45% of those in agreement referring to the statement that, the assigning related *research professors into areas of bona fide applicability to the task of design studio activities* is very important to the sustainable reformation in the architectural education in Nigeria. Hence, schools of architecture must ensure that lecturers whose research interest are in specific architectural practice be encourage to be active members of relevant design studio activities and the tradition of inviting architects in practice to participate in design studio activities should be encouraged and maintained.

The **eleventh statement**: *Teach basic drawing with constant reference to the most recent research in cognitive science and visual perception*, also has a high per cent of 98% different levels of agreement from the result. The works of other professionals should be celebrated and referenced to inspire the creativity in students. This will require the support of NIA and ARCON to support the initiative and relate closely with the schools of architecture in this regard.

Similarly, the result of the final and **twelfth statement** had a 100% agreement with about 44% as shown on Table 1 believed the statement is very important. Studio instructors in Nigeria should ensure student-to-student collaborations are encouraged, where such is not in, by giving out group student assignments alongside other educational activities. The student-student design studio assignment has the potential for better design outcomes.

Other comments provided by respondents:

1. Hand drafting should be encouraged to the postgraduate level. Another respondent wrote – "hand drawing is fundamental" and a lone contrary comments was for schools of architect "to dead manual drafting."
2. The decline in the architectural practice in Nigeria is due to the introduction of computer drafting in the university system. In order to have a sustainable future, free hand drawings and technological/computer tools must be adopted to complement each other. A similar opinion was expressed thus; digital tools are to be used for only enhancement purposes only.
3. The need for collaborations cannot be overemphasis and students must be encouraged to express themselves without limits during design studio.

4. Continuous training, updated on new innovations and software of faculty members is necessary for their development and to provide students with information on current trends in architecture.
5. History of architecture should not be taught as a lone subject but alongside contemporary architecture as a course during training. Another responded added that, "new and tested process are of equal importance".
6. Develop a guide and syllabus for organisations where students are sent for their Student Industrial Work Experience Scheme (SIWES).
7. Architecture students should be trained to think outside the box.

These comments from a few of the respondents were a reflection of the results obtained from the survey.

5. CONCLUSION AND RECOMMENDATIONS

The socio-economic effects of road projects to the development of a nation, the

The focus of this study is the promotion of sustainable architectural education in the Nigerian context, using Hewitt's book which sought to enable the architect 'see" through the design processes via history to enhance design capacities and sustainable innovations for the future. The discourse therein, was not only in the education process, but on how and what needs to be pursued to position particularly the architect in training to be able to deal with the rapid pace of technological change, new educational pedagogy, sustainable requirements in a highly interconnected world, and how complex problems that require multidisciplinary solutions are pursued through an appropriate education. This is because architectural design education has an important role in improving the future practice of architecture.

Overall, Hewitt: Draw in order to see is an exciting springboard that gauges the Nigerian architectural education and its contextualization as this study suggests. It is also a remainder to the fact that, although architecture is dynamic, there are processes and trends that will continue to form the basic start point for sustainable design outcomes, despite the continuous environmentally induced changes, innovations and other challenges affecting the practice of architecture.

Consequently, this study recommends the following;

i. Emphasize free hand drawing at the concept formation for cognitive critical thinking in the initial design process.
ii. Encourage, promote and theoretical historical processes and trends in design and practice.
iii. Harmonizing architectural education towards global sustainable trends to be monitored by NIA, ARCON and NUC for standards and uniformity across all schools of architecture.
iv. Embed into architectural education, site visits and ensure contacts with artisans, manufacturers and tradespersons in line with global practice.
v. Current sustainable innovations in architecture within Nigeria and beyond Nigeria must form part of the Nigerian architectural education reference.
vi. Ensure every level and studio activities of architectural education are guided towards current architectural practices and industry requirements.
vii. Student-to-student, student-to-industry and student-to-research collaborations must be encouraged. Also,

viii. The continuous use of hybrid education, which engages with technological tools, visuals, and cognitive creative thinking are a necessary.

This study's limitation is in its use of a single methodology and context but serves as a springboard for kick starting further research for the way forward for architectural education using other methodologies in the Nigerian context and other contexts around the world.

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