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PORTFOLIO ASSESSMENT AND CONTACT-HOUR-BASED EVALUATION: IMPROVING DESIGN MISCELLANY IN NATIONAL BOARD FOR TECHNICAL EDUCATION-ACCREDITED SCHOOLS OF ARCHITECTURAL TECHNOLOGY

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ABSTRACT

In Architectural Education, the assessment of design courses is elaborate as it involves a collective and trinitarian strategy of the studio masters, the jurors, and the department board to assess the student's ability to interpret and proffer solutions from thought processes to built space. Unfortunately, assessment is inconsistent in the National Board for Technical Education (NBTE)--accredited schools as institutions adopt and deploy several versions of assessment scoresheets with varying variable weightings. This connotes confusion while there subsists an unsavory attachment to students' cognitive ability to the detriment of their affective and psychomotor persuasions. This study is hinged on the fact that measurement of our diplomates' performance in design courses is structurally flawed while evaluation of design miscellany is near-absent. The study was conducted in January 2022. It involved four (4) NBTE-accredited institutions that offer Architectural Technology. The methodology adopted includes structured questionnaires, structured interviews, observations, comparative analysis of scoresheets from such institutions, and archival retrieval of policy documents. Purposive sampling was utilized to administer structured questionnaires to 45 lecturers out of 63 lecturers serving in these institutions thus constituting 71.43% of the entire academic staff population. Part of the objectives were to: define the limits of assessment and evaluation protocols in Architectural Education with a particular focus on design courses and determine the variables that constitute criteria for assessment of portfolios. Results revealed a near-absence of evaluation of design miscellany in Architectural Education. This was in addition to the adoption of an incompatible assessment structure of design courses in the October 2020 NBTE curriculum for Architectural Technology. The study recommended the adoption of a regularized Portfolio Assessment Sheet (PAS) and nouveau Contact-hour Based Evaluation module (ChBE) for measurement of competence in design miscellany. A review of the assessment structure of design courses in the October 2020 NBTE curriculum and appraisal of the subsisting policy on Architectural Education were also considered imperative.

Keywords: Architectural Education, Contact-hour Based Evaluation, Design Miscellany, Portfolio Assessment Sheet.

completely different from evaluatory criteria which are expected to measure the output and capacity of these students in affective and psychomotor domains (Leslie , 2023). Most assessment route only boosts cognitive stimulation (Bitbrain Team, 2023). This underscores the need to produce individuals with high and effective output in all the domains of learning which is assured through proactive evaluatory mechanisms. The foundation has already been laid: assessment of portfolios. However, the entire process must be seen through understanding that proficiency in singular design courses does not translate to capacity in design miscellany (Michael & Don , 2020). A student is deemed to be truly dexterous in design if such a student exhibits finesse, not just in assessment, but also in evaluation; when an unbiased instructor can pass clinical judgment of such a student's overall ability (National Academy of Sciences, 2020).

This study is billed to bring to the fore, the issue: the near-absence of evaluatory mechanism of design miscellany in National Board for Technical Education (NBTE)-accredited schools of Architectural Technology which is impinging on qualitative Architectural Education in Nigeria.

In (a), this paper will offer existing scenarios of assessment and evaluation in Architectural Education. Resources lending credence to this assessment will be drawn from the recently approved NBTE curricula for Architectural Technology. In (b) and (c), efforts were made to outline the variables adopted for assessing schemes in jury sessions across NBTE-accredited schools of Architectural Education. These variables have been collated over time through participation in exit jury examination sessions of NBTE-accredited schools of Architecture as contained in jury scoresheets. There will also be expository references of evaluatory indices as floated by unique pedagogy vested in design education. In (d), this study floated, for the first time, a template that will proffer the true status of students' assessment and evaluation performances in design miscellany.

Area of the Study:

This study was conducted in NBTE-accredited schools of Architectural Technology domiciled in the South-East geopolitical region of the country. The institutions include Akanu Ibiam Federal Polytechnic Unwana, Federal Polytechnic Nekede, Owerri, Federal Polytechnic Oko, Anambra State, and Abia State Polytechnic, Aba (NBTE, 2023).

Significance of the study:

The significance of this study is vested in the long-standing misconception that a

student's performance in design could only be adjudged from scores of a single design course. It is pertinent to disabuse the fact that students' ability in the design miscellany could only be attributed to assessment of drawings and reports of single design courses.

METHODS

The procedure for the collation of data in this study comprised archival recoupment, deployment of structured questionnaires interviews and observations. Structured questionnaires were administered to 45 lecturers through purposive sampling from a population of 63 lecturers. Efforts were made to factor in the most senior members of each department and institution that were duly registered with relevant professional bodies.

PORTFOLIO ASSESSMENT IN ARCHITECTURAL EDUCATION

The jury system of assessment commenced in the Ecole des Beaux-Arts in Paris (School of Fine Arts) in 1648 (Natasha , 2023). In the early years, schemes were assessed privately by the project supervisors at their discretion and without external contributions. This process was later reviewed at the beginning of the 19th Century when the aforementioned institution decided to grant students observatory status during the sessions (Lauren , 2023). This means that more credibility must be attached to the process as fulfilment for scholarly endeavour. In all accredited polytechnics of Architectural Technology, the jury system has been formally recognized as an examination to check originality of authorship, convinced upon credibility and capability of students to communicate effectively and prove beyond reasonable doubt that they understand design ethos (Kandarp , 2014). Ilke (2016) asserts that the portfolio assessment targets students' metacognitive skills and the outcome of the assessment depends on the quality of the portfolio presentation. Other domains of learning which are vested in psychomotor and affective persuasions are not taken into consideration. This is where we have challenges; hinging the overall learning of the student on portfolio assessment and exclusion of evaluatory mechanisms that could open vistas into students' apperception of skills and attitudes (Md. Enamul , 2016).

In all NBTE-accredited schools of Architectural Technology, entirety of design courses in a program constitutes the design miscellany. These courses are equipped with distinct contents that prepare the student to engage in anthropometry and design processes and engage in the design of varied building types up till they are fully

disposed to engage in independent projects (NBTE, 2020). This is at the HND level. At the ND level, the design courses are retrofitted with contents that enable student-architects develop current design concepts and theories, analyse and explain design briefs, describe general space requirements, list elements in an architectural design, describe the development of current design concepts, justify the development of the initial sketch scheme and take up design projects with minimal concomitant reportage (NBTE, 2020). Depending on the contact hours specified for each design course, the student architects are supervised, guided, and mentored to fully understand the scheme, interpret, resolve, and engage in expository discussions toward scholarship in design. Jurors are invited as external examiners from the industry, the institution and the academia to moderate the sessions through barrages of healthy posers and critiques meant to elicit responses that are intended to build the student-architect's confidence and communication prowess. Scores are awarded based on the variables being investigated. Observations noted that these variables and their weightings are not standardized across studied NBTE-accredited schools of Architectural Technology. Closure of jury sessions targets the summation of garnered scores which is used to assess the outcome of the student-architect's performance in design courses (Alagbe, *et al.*, 2017). However, such an outcome does not offer a kaleidoscopic appraisal of the student-architect's ability in design miscellany as evaluatory decisions by the studio master are not factored in.

CRITERIA FOR PORTFOLIO EVALUATION

The National Board for Technical Education, Curriculum and Course Specifications for National Diploma and Higher National Diploma in Architectural Education released in October, 2020 has theoretical and practical contents for all courses approved including all the design courses. These courses include:

a. National Diploma level: Basic Design (Arc 111), Architectural Design I (Arc 121), Architectural Design II (Arc 211), Architectural Design Project and Report (Arc 221) and

b. Higher National Diploma level: Advanced Architectural Design I (Arc 311), Advanced Architectural Design II (Arc 321), Advanced Architectural Design III (Arc 411), Advanced Architectural Design Project & Report (Arc 421).

These courses require portfolio assessment as part of their modalities for closure except

Basic Design (Arc 111) which, at its level, is designed to develop a student's interest and creative ability in Architecture. Invariably, a student is supposed to participate in three (3) portfolio assessments at the ND level (NBTE, 2020) and four (4) portfolio assessments at the HND level (NBTE, 2020). It is pertinent to note that the NBTE Curriculum and Course Specifications for ND/HND Architectural Technology have Specific Learning Objectives, Teachers Activities, and Evaluation under its Practical Content. The contents of the 'Evaluation' are teacher-deployed and identifiable learning designations for the students. They delineate the outcomes of the Specific Learning Objectives. They do not measure the competence of the students in design miscellany. This is the identifiable lacuna of the NBTE, October 2020 curriculum. The 'evaluation' contained in the NBTE curriculum is not in tandem with the major definition of 'Architecture Evaluation' which involves the activity of appraising architectural design decisions of an (envisioned) system in order to build confidence that the system can fulfil the concerns of the stakeholders (Magnus , *et al.*, 2022). Magnus, et al went further to state that "evaluation techniques are more succinct and viable if they evaluate what is documented in an architectural description". Invariably, evaluation should be done from the portfolio (architectural description). These stakeholders are individuals, groups and organizations who are more concerned with the quality of delivery and output of our diplomates than their cognitive capacity (Magnus , *et al.*, 2022). To this end, a methodology needs to be deployed to evaluate students' architectural descriptions thus putting effective closure to the entire exercise of measuring competence in design miscellany. This singular purpose led to the advancement of the Contact-hour Based Evaluation (ChBE) deployable by studio masters. This evaluatory methodology will be based on a 5-modal system which will provide valuable information on the students' capability in:

a. *Fluency and Clarity of Communication,*
b. *Imagination, Innovation and Creativity,*
c. *Understanding the Design Process,*
d. *Details and Overall Aesthetics* and
e. *Technical Competence* (Ulrich, 2023)

As shown in figure 1, each criterion for evaluation guides the studio masters in the appraisal process. The process commences after the portfolio has been assessed by the jury. Due to the sensitive and thorough nature of the exercise, the evaluation is conducted once for each student. The student must have collated all his/her portfolios for the entire programme which the studio master collects and appraises. The appraisal should be seamless and interactive since the studio master knows the students' cognitive, psychomotor and affective capabilities. The ChBE completes the exercise by appraising the entire portfolios in conjunction with interpersonal information of the students garnered over time by the studio masters. Such information will enable them to advance reliable evaluation of the students.

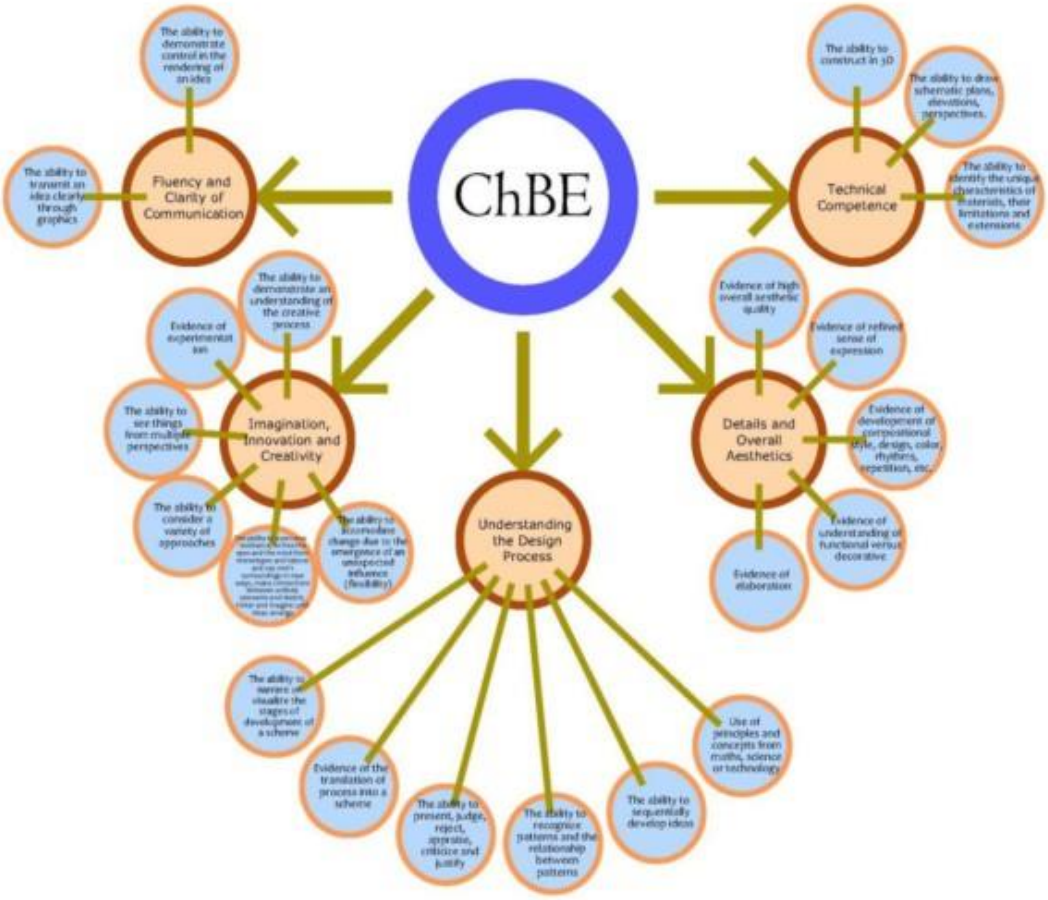

Figure 1: The 5-modal system of the ChBE to be adopted by studio masters
Source: Authors' workstation

RESULTS AND DISCUSSION

The results and discussions herein contained are targeted to the aforementioned objectives of this study.

Limits of assessment and evaluation protocols in Architectural Education:

These have been fully discussed in preceding sections.

Determine the variables that constitute criteria for assessment of portfolios:

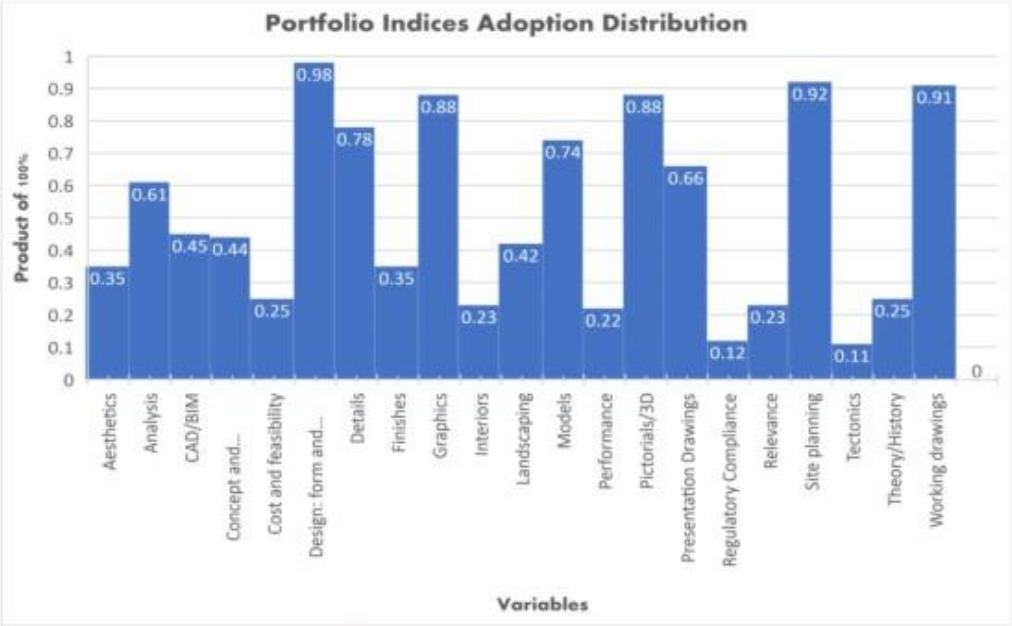

Figure 2: Portfolio Indices Adoption Distribution.
Source: Authors' workstation

To determine the variables that constitute criteria for assessment of portfolios, structured

questionnaires were administered to 45 lecturers in all the participating institutions. Purposive sampling (Ray, 2012) was adopted to select the respondents which included most senior members of the participating institutions. In the questionnaire, 20 portfolio indices were listed for possible adoption. Of the 20, only 9 items scored above 50th percentile which was the average benchmark for adoption (Curt , 2023). Figure 2 shows the portfolio indices adoption distribution specifying variables that should be reflected on jury scoresheets of departments of Architectural Technology during jury sessions. Concomitant score-weights are determined

at the purview of the curriculum review board of the NBTE.

The Structured Questionnaire and its indices: Data collated:

The following indices guided studies into ChBE and its level of affirmation or rejection by respondents. It must be stated that the questionnaire was tested for face and content validity by professionals in the academia and the industry. These resource persons are not part of the respondents. The questionnaire had the following items (1-5) with an option of affirmation (Yes) or rejection (No). Affirmation must be ≥ 50%.

1. Mounting ChBE exercises for affective and psychomotor measurement in design miscellany at both ND and HND programmes of study:

This index elicited responses that showed marked affirmation of ChBE exercises for exit students at the Higher National Diploma level with an affirmation of 65.5% as shown in figure 3. The same figure shows responses in favour of the exercise at the ND level which

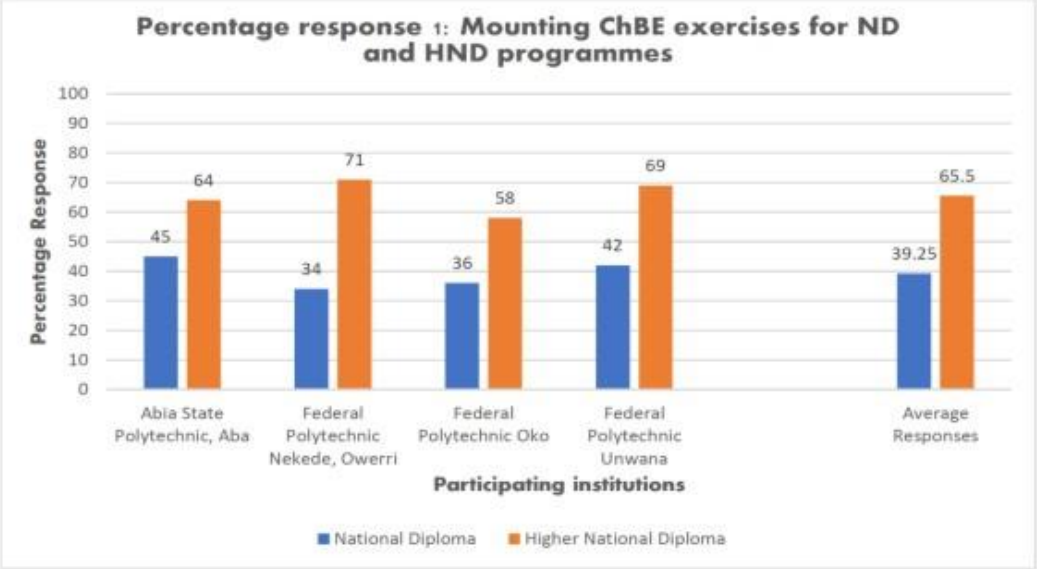

Figure 3: Percentage response 1: Mounting ChBE exercises for ND and HND programmes. *Source: Fieldwork and authors' workstation*

stood at 39.25%.

2. Exercise will be conducted by studio masters who must be duly registered with NIA/ARCON:

Figure 4 shows elicited responses towards the status of the personnel that should conduct/engage the students in ChBE exercises. Percentage distribution of responses stands at 49.75% for rejection and 50.25% for affirmation of the index.

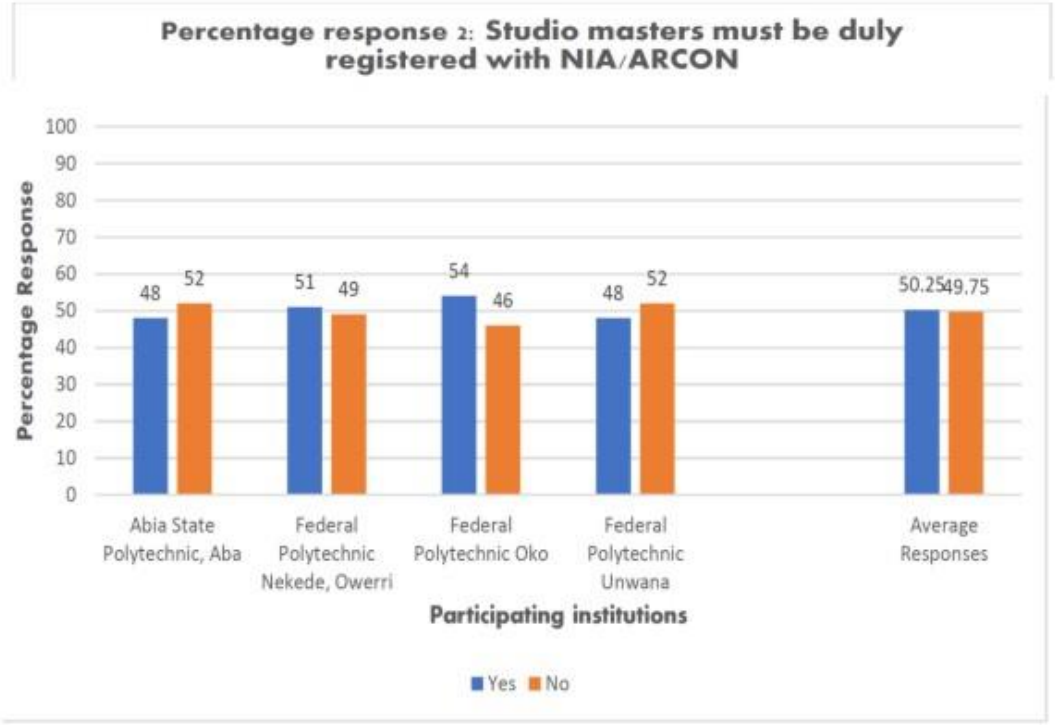

Figure 4: Percentage response 2: Studio masters must be duly registered with NIA/ARCON. *Source: Fieldwork and authors' workstation*

3. Results from standardized portfolio assessments + ChBE(s) should form valid measurements of competence for HND diplomates wishing to proceed for professional examinations

Data collated for this response is as shown in figure 5. Percentage distribution of responses stands at 38.25% for rejection and 61.75% for affirmation of the index.

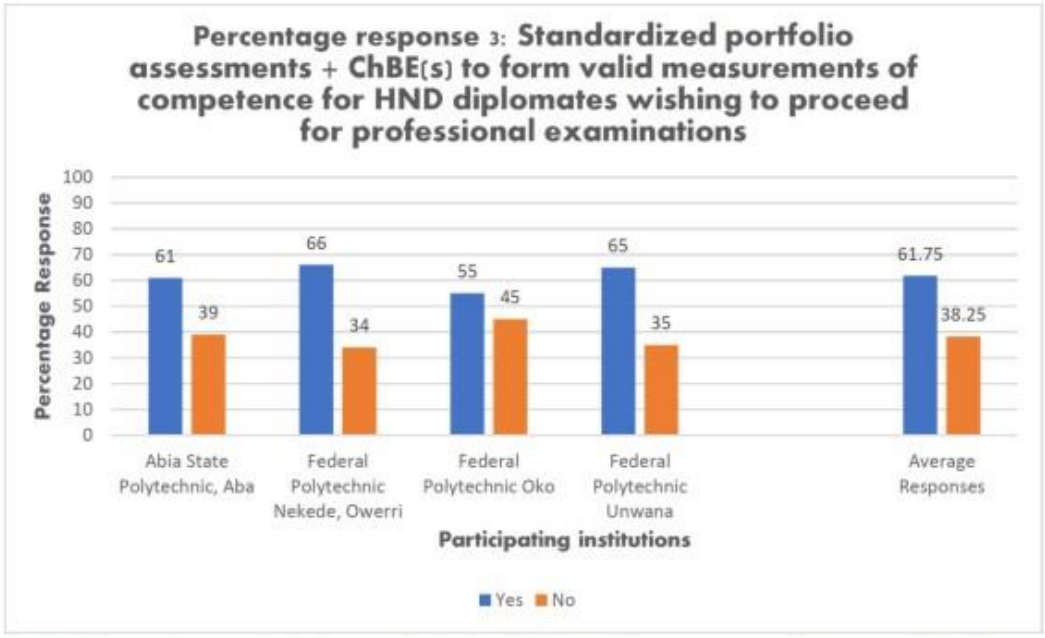

Figure 5: Standardized portfolio assessments + ChBE(s) to form valid measurements of competence for HND diplomates. *Source: Fieldwork and authors' workstation*

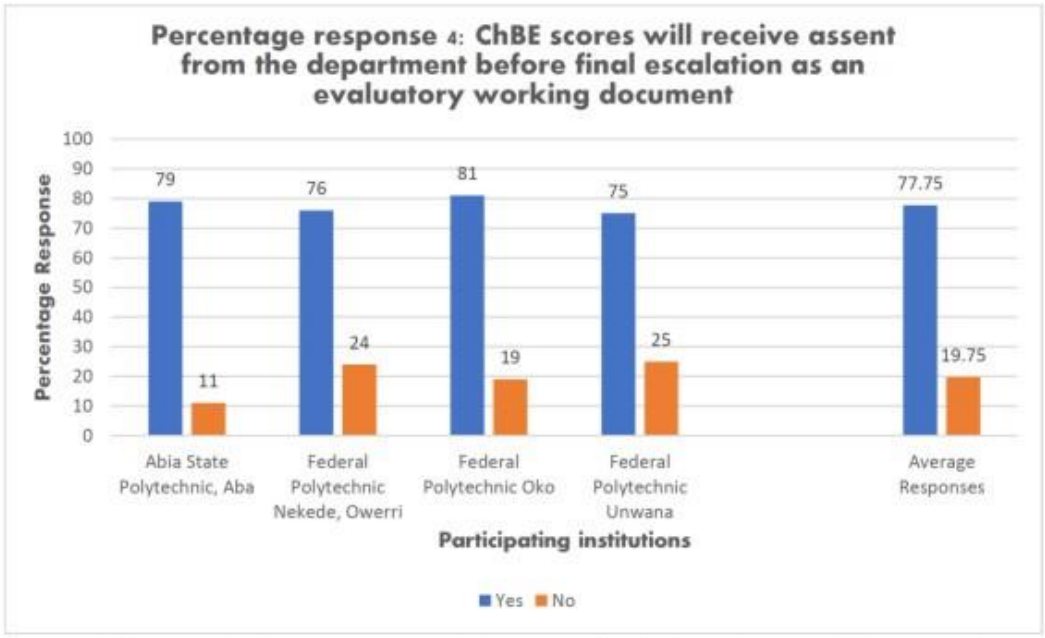

Figure 6: ChBE scores will receive assent from the department before final escalation as an evaluatory working document. *Source: Fieldwork and authors' workstation*

4. ChBE scores will receive assent from the department before final escalation as an evaluatory working document

In figure 6, results showed the extent of affirmation for ChBE scores to pass through approval and authentication by the departmental board before it can be used as an evaluatory working

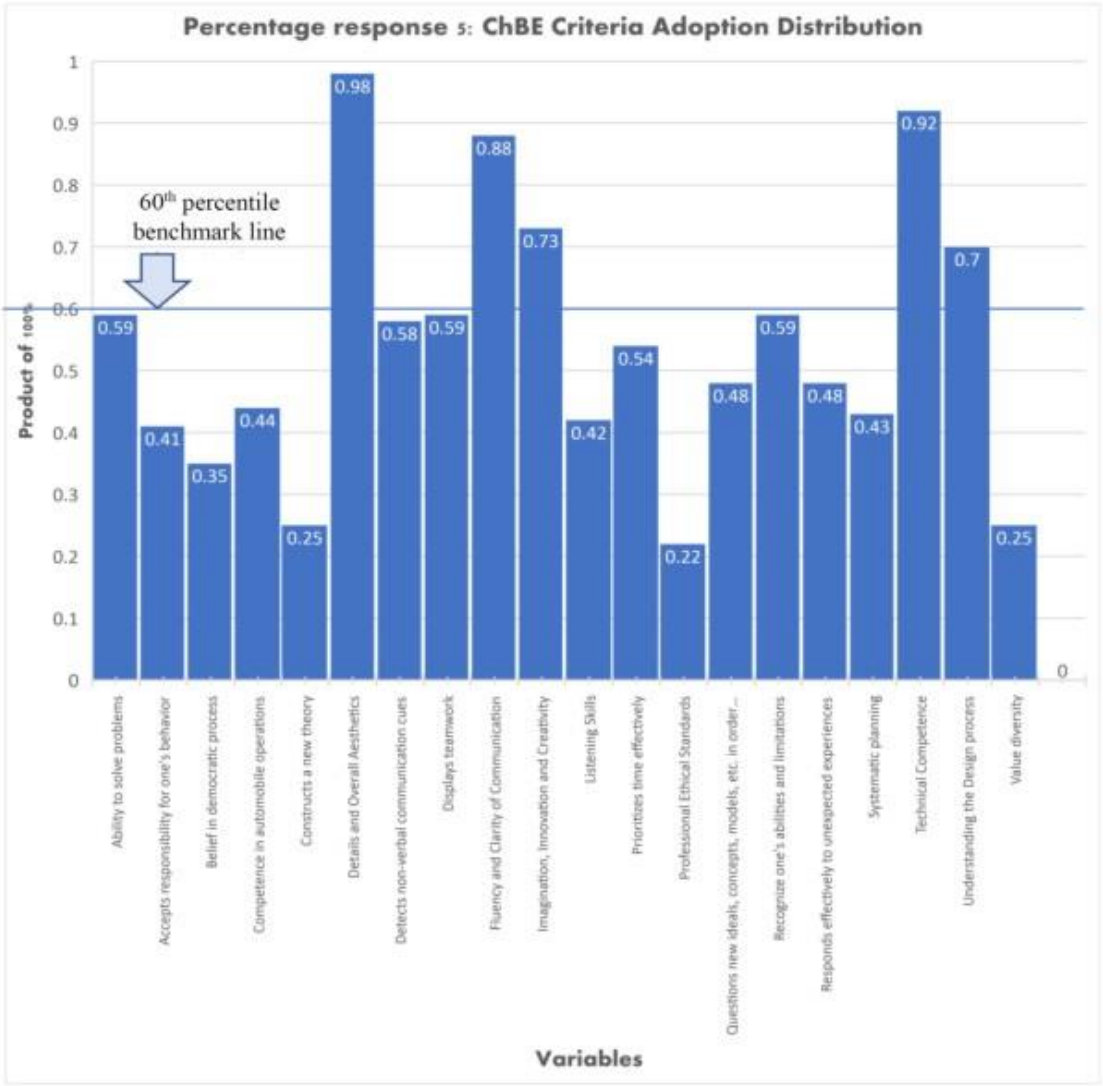

Figure 7: ChBE Criteria Adoption Distribution. *Source: Fieldwork and Authors' workstation*

rejection and 77.75% for affirmation of the index.

5. Adoption of ChBE indices

With respect to (d) in objectives, 20 evaluatory indices were floated. Only 5 items met approval of the respondents. Benchmark for approval was slightly above average at 60th percentile as one of the requirements for content validity (Curt , 2023). Data extracted from figure 7 informed the 5-modal system of the ChBE.

Proposed Templates for Portfolio Assessment and ChBE

An effective portfolio assessment template is shown in table 1. Variables that scored ≥ 50% where adopted for a cumulative weighing of 80%. Individual weightings will be specified by the NBTE Curriculum Review Board. It is expected that the weightings of the HND programme will be slightly different from the weightings of the ND programme.

Table 1: Proposed Portfolio Assessment Sheet (PAS) for jury sessions

PORTFOLIO ASSESSMENT SHEET: NATIONAL DIPLOMA/HIGHER NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY													
S/n	Name	Registration No.	Supervision	Analysis	Design: Form and Function	Details	Graphics	Models	3-dimesional drawings/pictorials	Presentation drawings	Site planning	Working drawings	**Total**
			20%										100%
1.													
2.													
3.													

Weightings will be decided by participants of the Curriculum Review Board for National Diploma and Higher National Diploma programmes

Source: Fieldwork and Authors' workstation

The template for the ChBE is derived from the 5-modal system of the ChBE. At the National Diploma, three (3) projects from its (3) design courses will be subjected to ChBE. They include ARC 121, ARC 211 and ARC 221. Table 2 shows the template structure of ChBE for National Diplomates. At the Higher National Diploma level, four (4) projects from its four (4) design courses will be subjected to ChBE. They include, ARC 311, ARC 321, ARC 411 and ARC 421.

Table 2: ChBE template for National Diplomates

ChBE: NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY																				
s/n	**Name**	**Reg. No.**	Fluency and Clarity of Communication			Imagination, Innovation and Creativity			Understanding the Design Process			Details and overall Aesthetics			Technical Competence			**Average**	**Remarks**
			Scheme 1 (ARC 121)	Scheme 2 (ARC 211)	Scheme 3 (ARC 221)	Scheme 1 (ARC 121)	Scheme 2 (ARC 211)	Scheme 3 (ARC 221)	Scheme 1 (ARC 121)	Scheme 2 (ARC 211)	Scheme 3 (ARC 221)	Scheme 1 (ARC 121)	Scheme 2 (ARC 211)	Scheme 3 (ARC 221)	Scheme 1 (ARC 121)	Scheme 2 (ARC 211)	Scheme 3 (ARC 221)		
1.																			
2.																			
	Remarks: **1.** Strongly advised to consider change of course and/or escalation of strong psychomotor skills **2.** Needs counselling in grey areas, ascertain status of other academic records and consequent re-evaluation for possible improvement. **3.** Counselling to use areas of strength as source of improving identifiable areas of challenge during SIWES **4.** Positive reinforcement to sustain progress in contribution to SIWES. **5.** Maintain excellence in contribution to SIWES, career progression and future professionalism.																		
	RATING SCALE: 1 Low | 2 Fair | 3 Good | 4 Very Good | 5 Exceptional Studio master: _____ *Name|Signature|Date*																		

Source: Fieldwork and Authors' workstation

Table 3 shows the template structure of ChBE for Higher National Diplomates**.** In both instances, the reviewer/studio master rates the performance of the student at the end of each academic semester's design course and authenticates the sheet for escalation for accent by the departmental board. The template is expected to be populated by the number of students in the department.

Table 3: ChBE template for Higher National Diplomates

ChBE: HIGHER NATIONAL DIPLOMA IN ARCHITECTURAL TECHNOLOGY																								
S/n	**Name**	**Reg. No.**	Fluency and Clarity of Communication				Imagination, Innovation and Creativity				Understanding the Design Process				Details and overall Aesthetics				Technical Competence					
			Scheme 1 (ARC 311)	Scheme 2 (ARC 321)	Scheme 3 (ARC 411)	Scheme 4 (ARC 421)	Scheme 1 (ARC 311)	Scheme 2 (ARC 321)	Scheme 3 (ARC 411)	Scheme 4 (ARC 421)	Scheme 1 (ARC 311)	Scheme 2 (ARC 321)	Scheme 3 (ARC 411)	Scheme 4 (ARC 421)	Scheme 1 (ARC 311)	Scheme 2 (ARC 321)	Scheme 3 (ARC 411)	Scheme 4 (ARC 421)	Scheme 1 (ARC 311)	Scheme 2 (ARC 321)	Scheme 3 (ARC 411)	Scheme 4 (ARC 421)	**Average**	**Remarks**
1.																								
2.																								

Remarks:

1. **Strongly advised to consider change of course and/or escalation of strong psychomotor skills.**
2. **Needs counseling in grey areas, ascertaining the status of other academic records and consequent re-evaluation for possible improvement.**
3. **Counselling to use areas of strength as a source of improving identifiable areas of challenge towards building delivery.**
4. **Positive reinforcement to sustain progress towards service delivery and licensure.**
5. **Maintain excellence in referred competitions, career progression, and licensure.**

RATING SCALE:

1 Low | 2 Fair | 3 Good | 4 Very Good | 5 Exceptional

Studio Master: ______________________________

Name|Signature|Date

Source: Fieldwork and Authors' workstation

CONCLUSION

This study has identified the issues surrounding the assessment of design courses and evaluation of design miscellany. It has also identified the unsavoury belief that cognitive ability in design is all that is needed to measure a student's skills in design miscellany. This belief and its concomitant methodology have continuously affected the quality of Architectural Education and its diplomates. To this end, the study has floated salient strategies which are expected to be escalated to appropriate authorities for implementation towards the improved capacity of Architectural Technology students in particular and the manpower/skill-set base of the nation in general.

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