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Assessing the Disjuncture Between Academic Drafting Competencies and Professional Practice Requirements in Architecture in Nigeria

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ABSTRACT

This study empirically examines the disjuncture between academic drafting competencies and professional practice requirements in architecture in Nigeria. A sequential explanatory mixed-methods design was adopted. The quantitative phase involved a survey of architectural practitioners from ARCON-registered firms in Lagos, Abuja, Port Harcourt, and Enugu. A total of 150 questionnaires were targeted and distributed, of which 132 valid responses were obtained, representing an 88.0% response rate. The survey measured 28 architectural drawing competencies using a 5-point Likert scale. The qualitative phase involved content analysis of curricula from five selected accredited architecture programmes, assessment of 50 final-year student portfolios and 30 graduate/intern portfolios using a 10-criteria Drawing Assessment Rubric, and semi-structured interviews with academic and professional stakeholders. The instruments demonstrated acceptable validity and reliability, with a content validity index (CVI) of 0.84, Cronbach's alpha coefficients ranging from 0.82 to 0.91, and an inter-rater reliability coefficient of 0.81. Data were analysed using descriptive statistics, Relative Importance Index (RII), gap analysis, independent-samples t-test, and thematic analysis. The findings indicate substantial competency gaps in MEP/structural coordination (Gap = 2.63), Revit/BIM (2.54), wet-area detailing (2.38), and layer management (2.31), while freehand drawing and manual orthographic drawing recorded negative gaps. Curriculum analysis showed that an average of 6 out of 68 studio-related credits (8.8%) were explicitly devoted to working drawings across the selected programmes. Manual drawing remained prominent, while BIM provision was not uniform across the programmes. Portfolio assessment showed that the graduate/intern group recorded significantly higher scores than the final-year group ($t = 7.82$, $p < 0.001$). The major factors identified by practitioners included the continued emphasis on manual methods relative to BIM, limited lecturer capacity in BIM, inadequate ICT and software resources, weak SIWES structures, assessment practices that emphasise presentation over buildability, and limited industry–academia collaboration. The study proposes a four-pillar Competency Alignment Framework centred on curriculum reform, capacity building, structured industry experience, and stronger industry–academia partnerships. The framework provides a basis for further evaluation and refinement aimed at improving the alignment between architectural education and professional practice requirements in Nigeria.

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Keywords: Architectural education; drafting competency; BIM; working drawings; competency gap; curriculum alignment; professional practice; CCMAS

INTRODUCTION

Architectural drawing is a fundamental means through which architects develop, communicate, coordinate, and document design ideas. From preliminary sketches to detailed construction documents, drawings translate architectural intentions into information that can be interpreted by clients, consultants, contractors, regulatory authorities, and other participants in the building process (Emmitt and Gorse, 2010; Lawson, 2005). Consequently, competence in architectural drawing extends beyond visual representation to include technical accuracy, constructability, coordination, documentation standards, and the effective use of digital technologies.

Architectural education in Nigeria has historically been influenced by conventional architectural education models that placed considerable emphasis on manual

drafting, freehand drawing, orthographic projection, measured drawing, rendering, and design presentation (Olotuah, 2005; Adegbile, 2012). These skills remain relevant because manual drawing can support design thinking, observation, spatial understanding, and conceptual development (Hanna, 2022). However, developments in computer-aided design (CAD), building information modelling (BIM), and integrated digital workflows have substantially changed the nature of architectural documentation and professional practice. CAD technologies introduced greater precision, speed, reproducibility, and flexibility into architectural documentation, gradually changing the way working drawings were produced and managed (Ibrahim and Abdullahi, 2019; Akinola et al., 2021). BIM has further expanded the role of digital technology by integrating geometric and non-geometric information within coordinated building models. BIM-enabled workflows can support multidisciplinary coordination, clash detection, information management, documentation, and project delivery (Eastman et al., 2020; Saka and Chan, 2020). These developments mean that contemporary architectural practice requires graduates to possess a broader combination of manual, technical, digital, and professional competencies.

In Nigeria, the transition from conventional drafting to digitally supported architectural practice has not necessarily occurred at the same pace within educational institutions. Previous studies have identified concerns about the preparedness of architecture graduates for professional practice, including deficiencies in technical documentation, digital competencies, employability skills, and the connection between academic training and industry requirements (Opoko et al., 2022; Afolabi et al., 2023; Tunji-Olayeni et al., 2023). Although curriculum reforms, including the introduction of the Core Curriculum and Minimum Academic Standards (CCMAS), have sought to strengthen digital and professional competencies, questions remain regarding the extent to which these expectations are reflected in actual studio teaching, assessment, infrastructure, and graduate competencies (NUC, 2022).

Professional practice requires architectural graduates to contribute to the preparation of coordinated and technically reliable documentation, including working drawings, construction details, schedules, annotations, and drawings that support multidisciplinary coordination and statutory approval. In addition, architectural firms increasingly use digital platforms and BIM-related workflows in different forms, creating a need for graduates to develop competencies that correspond to contemporary professional requirements (Saka and Chan, 2020; Saka et al., 2024).

The central concern of this study is therefore the extent to which the drafting competencies developed and assessed within architectural education correspond to the competencies expected in professional practice. Rather than treating the issue solely as a deficiency in students' technical skills, the study considers the relationship between curriculum content, teaching and assessment practices, institutional capacity, industry exposure, and professional expectations. Understanding this relationship is important for improving the transition of architecture graduates from university-based studio education to professional practice.

The transition from architectural education to professional practice presents a significant challenge where the competencies developed in universities do not adequately correspond with those required in practice. In architectural education, students are commonly exposed to design studios in which conceptual development, visual presentation, creativity, and design communication constitute important components of assessment. Professional practice, however, also requires graduates to prepare technically accurate, coordinated, and buildable documentation and to work with digital tools, building regulations, office standards, and multidisciplinary consultants (Akinola et al., 2021; Afolabi et al., 2023).

Previous studies in Nigeria have reported concerns regarding the preparedness of architecture graduates for professional practice. Employers have identified gaps in technical and employability competencies, while studies of architectural curricula have raised concerns about the alignment of academic programmes with changing professional requirements (Opoko et al., 2022; Tunji-Olayeni et al., 2023). Similarly, research on BIM and digital competencies suggests that although digital technologies are increasingly relevant to architectural practice, the level and timing of their integration into architectural education remain uneven (Olanrewaju et al., 2022; Saka et al., 2024).

The problem can be considered from three related dimensions. The first is a competency mismatch. Academic assessment may place substantial emphasis on conceptual and presentation skills, whereas professional practice places considerable importance on technical detailing, documentation, accuracy, coordination, and compliance with applicable standards. The second is a technology mismatch, arising where students receive limited or late exposure to CAD, BIM, and other digital documentation processes compared with the technologies used by contemporary firms. The third is a practice and standards mismatch, where students have limited opportunities to work with office documentation procedures, multidisciplinary coordination, statutory requirements, and other processes that characterise professional architectural practice.

The consequences of such mismatches extend beyond graduate employability. Inadequate technical documentation can contribute to communication problems, coordination difficulties, rework, and

variations during construction. Research on construction projects in Nigeria has linked deficiencies in project documentation and coordination with challenges in project delivery (Alao et al., 2020). At the same time, studies of architectural education have emphasised the need for stronger links between universities and professional practice to improve graduates' practical preparedness (Adegbile, 2012; Afolabi et al., 2023).

Despite these concerns, there remains a need for empirical evidence that systematically compares the drafting competencies expected by professional practitioners with the competencies developed and demonstrated within architectural education. Much of the existing Nigerian literature discusses curriculum challenges, employability, ICT adoption, or industry–academia relationships more generally. There is comparatively less empirical work that identifies and measures specific technical drafting gaps across manual, technical, digital/BIM, and professional-standard competencies.

This study therefore investigates the extent of the disjuncture between academic drafting competencies and professional practice requirements in selected architecture programmes and architectural firms in Nigeria. It also examines institutional and industry-related factors associated with the identified gaps and proposes a framework for improving competency alignment between architectural education and professional practice.

This study aims to assess the disjuncture between academic drafting competencies and professional practice requirements in architecture in Nigeria and to propose a framework to improve competency alignment. The specific objectives are to:

1. examine the nature and content of drafting and drawing training contained in selected accredited architecture programmes in Nigeria;
2. determine the drawing competencies and proficiency standards considered important for entry-level architectural practice;
3. identify and assess specific competency gaps between academic training and professional practice expectations;
4. examine institutional, pedagogical, technological, and industry-related factors associated with the identified competency gaps; and
5. propose a Competency Alignment Framework for strengthening the integration of professional drawing standards, digital technologies, and industry requirements into architectural education.

The study addresses the following research questions:

1. What drafting and drawing competencies are emphasised in selected accredited architecture programmes in Nigeria?
2. What drawing competencies are considered essential for entry-level professional architectural practice?
3. What gaps exist between the drafting competencies developed through academic training and the competencies expected in professional practice?
4. What institutional, pedagogical, technological, and industry-related factors are associated with the identified competency gaps?
5. What measures can be adopted to improve the alignment between academic drafting education and professional practice requirements?

The study has implications for architectural education, professional practice, students and graduates, regulatory bodies, and the wider built environment. For architectural education, the findings may provide evidence for reviewing curriculum content, studio assessment practices, digital technology integration, and the teaching of technical documentation. The findings may also contribute to ongoing discussions concerning the implementation of competency-based and digitally oriented architectural education (NUC, 2022; Opoko et al., 2022). For architectural practice, the study provides information on the specific competencies that practitioners consider important for entry-level graduates. This may assist firms in designing more structured internship, mentoring, and graduate development programmes. For students and graduates, identifying the competencies most strongly required in practice can provide clearer guidance on areas requiring further development, particularly technical detailing, construction documentation, BIM, multidisciplinary coordination, and professional standards. For professional and regulatory bodies, particularly the Architects Registration Council of Nigeria (ARCON) and the National Universities Commission (NUC), the findings may provide evidence for strengthening collaboration between professional practice and architectural education. Such collaboration could support more effective curriculum review, accreditation, internship structures, and competency assessment. More broadly, improved alignment between architectural education and professional requirements may contribute to better documentation practices and more effective communication among participants in the construction process. This is particularly relevant in a context where deficiencies in project documentation and coordination can affect project performance (Alao et al., 2020).

The study focuses on technical architectural drawing competencies and their relationship with professional practice requirements. It considers competencies associated with working drawings, construction detailing, documentation, digital drawing and BIM, multidisciplinary coordination, professional standards, and related office practices. The study does not primarily examine architectural history and theory, environmental science, or broader design theory except where these areas relate directly to drafting competency. Conceptual and presentation drawings are considered only for comparison with technical and professional documentation competencies. Geographically, the study

covers selected NUC- and ARCON-accredited architecture programmes and selected architectural firms in Lagos, Abuja, Port Harcourt, and Enugu. Five architecture programmes were purposively selected for curriculum analysis, while practitioners were drawn from registered architectural firms operating in the selected urban centres. The findings should therefore be interpreted within the context of the selected institutions, firms, practitioners, and portfolios rather than assumed to represent every architecture programme or architectural firm in Nigeria.

LITERATURE REVIEW

Evolution and Significance of Architectural Drawing

Architectural drawing has traditionally served as both a means of design thinking and a medium for communicating architectural intentions. It enables architects to explore ideas, develop spatial relationships, communicate design decisions, and provide information required for construction and project coordination (Lawson, 2005; Emmitt and Gorse, 2010). Drawing therefore performs both conceptual and technical functions within architectural education and professional practice. Historically, architectural education placed substantial emphasis on manual drawing techniques, including freehand sketching, orthographic projection, measured drawing, rendering, and graphical presentation. In Nigeria, architectural education developed within inherited educational traditions that gave considerable attention to design studios and manual representation (Olotuah, 2005; Adegbile, 2012). Manual drawing remains relevant to architectural education because it can support observation, spatial understanding, creativity, and design thinking. Hanna (2022), for example, argues that the continued use of manual drawing can contribute to designers' cognitive and visual development even within increasingly digital environments.

The development of computer-aided design (CAD) significantly changed architectural documentation. CAD provided greater precision, speed, reproducibility, and flexibility in the production and modification of drawings. Consequently, digital drafting gradually became an important component of architectural education and professional practice (Ibrahim and Abdullahi, 2019; Akinola et al., 2021). The transition to CAD, however, did not simply replace manual drawing; rather, it introduced additional competencies relating to digital drawing production, file management, standardisation, and documentation.

Building information modelling (BIM) represents a further development in the digital transformation of architectural practice. Unlike conventional CAD, BIM can integrate geometric information with information about building components and facilitate coordination among different project disciplines (Eastman et al., 2020). BIM can support model-based documentation, clash detection, information exchange, quantity-related processes, and multidisciplinary coordination. Its adoption has consequently created new expectations concerning the digital competencies of architecture graduates (Saka and Chan, 2020; Saka et al., 2024). The evolution from manual drawing to CAD and BIM therefore represents not simply a change in drawing tools but a broader change in the knowledge and competencies required of architectural professionals. Contemporary architectural documentation requires the integration of design knowledge, construction understanding, digital proficiency, information management, coordination, and professional standards.

Architectural Drawing as a Professional Competency

Competency-based approaches to professional education emphasise what learners can demonstrate in practice rather than merely the amount of time spent receiving instruction. Professional competence incorporates knowledge, skills, judgement, and the ability to apply these within particular professional contexts (Mulder, 2014). This perspective is particularly relevant to architecture because graduates are expected to apply design knowledge to practical problems involving construction, regulations, documentation, and coordination.

Architectural drawing competency consequently extends beyond the ability to produce visually attractive drawings. Professional documentation requires accurate dimensions, appropriate annotation, construction details, schedules, material information, coordination between disciplines, and compliance with applicable standards. International competency frameworks similarly emphasise the ability of architects to communicate and document design proposals and to produce coordinated technical information.

Within Nigeria, regulatory and curriculum documents recognise the importance of working drawings and professional documentation. The NUC curriculum framework identifies relevant competencies within architectural education, while professional requirements established by ARCON provide a broader context for the technical services expected within architectural practice (NUC, 2022; ARCON, 2020). However, the presence of a competency within a curriculum or professional document does not necessarily demonstrate that students acquire or demonstrate that competency at an appropriate level.

Empirical studies have therefore examined the preparedness of Nigerian architecture graduates from the perspective of employers and educational institutions. Adeyemi and Oluwatayo (2021) reported

differences between the competencies emphasised by academics and those valued by employers. Akinola et al. (2021) similarly identified concerns regarding the technical drawing competencies of architecture graduates in relation to professional expectations. More recent research has continued to highlight the importance of technical and digital competencies for graduate employability and professional practice (Afolabi et al., 2023).

These findings suggest that professional drawing competency should be examined as a multidimensional construct involving manual and conceptual skills, technical documentation, digital/BIM proficiency, and professional standards.

The Academia–Practice Gap in Architecture

The relationship between architectural education and professional practice has been a longstanding concern internationally. Architectural education must prepare students to respond creatively to design problems while also providing sufficient knowledge and skills for professional responsibilities. The challenge arises when academic priorities and professional requirements develop at different rates.

In Nigeria, studies have identified differences between university-based architectural training and the expectations of employers. Adegbile (2012) argued that architectural education needs stronger connections with professional practice, while Opoko et al. (2022) identified curriculum-related concerns in their analysis of Nigerian architecture programmes. Afolabi et al. (2023) similarly emphasised the importance of stronger industry–academia relationships for improving the employability and practical preparedness of architecture graduates.

One important dimension of the gap concerns the difference between design presentation and construction documentation. Academic design studios may give substantial attention to conceptual development, visual communication, and presentation, whereas professional practice requires graduates to contribute to coordinated documentation, detailing, specifications, schedules, and regulatory submissions. This does not imply that conceptual and creative competencies are unimportant. Rather, it suggests that professional readiness requires a balance between design, technical, digital, and organisational competencies.

Another dimension concerns exposure to actual professional workflows. University projects are generally completed within an educational environment with defined academic requirements, whereas professional projects involve clients, consultants, contractors, regulatory authorities, office standards, deadlines, revisions, and multidisciplinary coordination. SIWES and other forms of work-based learning can help bridge this difference, but their effectiveness depends on the quality and structure of students' professional experiences (Oluwatayo and Pirisola, 2020; Tunji-Olayeni et al., 2023). The literature therefore indicates that the academia–practice gap is multidimensional. It may involve curriculum content, teaching methods, technology, infrastructure, assessment practices, work-based learning, and the strength of relationships between universities and professional firms.

Digital Technology and Pedagogy in Architectural Education

The increasing use of CAD and BIM has intensified discussions about the appropriate place of digital technologies within architectural education. One perspective maintains that manual drawing should continue to play an important role because of its contribution to design thinking and visual understanding (Hanna, 2022). Another perspective advocates earlier integration of digital tools so that students can develop digital competencies alongside design development rather than treating them as supplementary skills. The issue is therefore not necessarily whether manual or digital drawing should be preferred, but how the two can be integrated effectively within architectural education. Students need opportunities to understand fundamental drawing principles while also learning how those principles are applied through contemporary digital tools.

Research in Nigeria indicates that the integration of digital technologies within architecture programmes is uneven. Olanrewaju et al. (2022) reported differences in BIM proficiency among architecture students, while Saka et al. (2024) identified the growing importance of BIM adoption within Nigerian architectural firms. Abiodun and Oladunmoye (2022) also examined CAD and BIM competency among architecture students and highlighted the need for stronger digital preparation.

The challenge extends beyond providing software. Effective BIM education requires appropriately trained lecturers, suitable hardware and software, curriculum integration, opportunities for collaborative learning, and assessment methods that evaluate digital processes as well as final visual outputs. Saka and Chan (2020) identified organisational and capacity-related barriers to BIM adoption in the Nigerian construction industry, suggesting that digital competency development must be considered within the wider institutional environment.

Studio pedagogy is particularly important because architectural competencies are often developed through repeated application rather than through theoretical instruction alone. BIM-based studio learning can provide opportunities for students to integrate modelling, documentation, coordination, and design decision-making within a common project environment (Kim et al., 2021). The integration of working drawing exercises with realistic project conditions may therefore provide a more direct connection between academic learning and professional documentation requirements.

Strategies for Bridging the Competency Gap

The literature identifies several strategies that may improve the relationship between architectural education and professional practice.

Competency-Based Curriculum

A competency-based curriculum can shift attention from the completion of courses toward the demonstrable abilities that graduates need to perform professional tasks. Such an approach requires learning outcomes, teaching activities, and assessments to be explicitly connected to professional competencies (Mulder, 2014). In architecture, this may include measurable competencies in technical drawing, detailing, digital modelling, documentation, coordination, and regulatory compliance. The NUC's CCMAS provides an opportunity for curriculum development that responds to changing educational and professional requirements (NUC, 2022). However, the effectiveness of curriculum reform depends on implementation at institutional and studio levels.

Industry–Academia Collaboration and SIWES

Industry exposure provides students with opportunities to observe and participate in professional workflows. SIWES can therefore serve as an important mechanism for connecting classroom learning with professional practice. However, studies have reported challenges relating to the structure, supervision, and learning outcomes of work-based training (Oluwatayo and Pirisola, 2020; Tunji-Olayeni et al., 2023).

A more structured approach could involve clearly defined learning outcomes, supervised technical tasks, competency records, feedback from professional mentors, and systematic assessment of students' work. Such mechanisms would make professional experience more closely connected to academic learning.

BIM and Digital Competency Development

BIM education should be integrated into the broader architectural curriculum rather than treated solely as an isolated software course. Students need to understand not only how to operate BIM software but also how digital models support documentation, coordination, information management, and project delivery (Eastman et al., 2020; Saka and Chan, 2020). This requires investment in infrastructure and staff development as well as curriculum reform. Without adequate institutional capacity, introducing BIM requirements may produce nominal curriculum compliance without corresponding student competence.

Practice-Oriented Studio and Professional Mentorship

Another potential strategy is to incorporate professional documentation standards and realistic project conditions into studio teaching. Practitioners can contribute through guest teaching, project reviews, mentoring, assessment, and collaborative studio activities. Such approaches can expose students to office standards, technical detailing, multidisciplinary coordination, and the practical consequences of drawing decisions. Foque (2020) emphasises the relationship between design knowledge and professional competence, while Afolabi et al. (2023) highlight the value of stronger connections between employers and educational institutions. Practice-oriented studio models may therefore help reduce the difference between academic assessment and professional expectations.

Synthesis of the Literature and Research Gap

The literature demonstrates that architectural drawing has evolved from a predominantly manual form of representation into a broader system of digital documentation and information management. Manual drawing remains valuable for design thinking and visual development, but professional practice increasingly requires additional competencies in technical documentation, digital tools, BIM, coordination, and professional standards (Hanna, 2022; Eastman et al., 2020). Studies in Nigeria have identified concerns relating to architectural graduate employability, curriculum alignment, digital competency, SIWES, and industry–academia collaboration (Opoko et al., 2022; Olanrewaju et al., 2022; Afolabi et al., 2023; Tunji-Olayeni et al., 2023). However, these studies have generally examined individual aspects of the education–practice relationship rather than systematically comparing the expected importance of specific drafting competencies with the level of competency demonstrated by graduates. A further gap concerns the integration of curriculum evidence, practitioner expectations, and portfolio-based assessment within a single study. Examining these sources together can provide a more comprehensive understanding of whether the competencies taught and assessed in architectural education correspond with those required in professional practice.

The present study addresses this gap by examining selected architectural curricula, assessing practitioner expectations and perceived graduate performance across specific drafting competencies, and analysing drawing portfolios. It further explores institutional and industry-related factors associated with identified competency gaps and uses the combined evidence to develop a Competency Alignment Framework.

The study therefore contributes to the literature by moving beyond a general assertion that a gap exists and seeking to identify where the gap occurs, how large the gap is across specific competency areas, what factors may be associated with it, and what educational and professional measures may help address it.

RESEARCH METHODOLOGY

Research Design

The study adopted a sequential explanatory mixed-methods design, in which quantitative data were collected and analysed before qualitative evidence was used to provide further explanation and contextual interpretation of the quantitative findings (Creswell and Creswell, 2023; Creswell and Plano Clark, 2018). The design was considered appropriate because the study sought not only to assess the difference between the drafting competencies expected in professional architectural practice and those perceived to be demonstrated by graduates, but also to understand the educational, institutional, and professional factors associated with the identified competency gaps.

The quantitative phase focused primarily on registered architectural practitioners, while the qualitative phase involved curriculum content analysis, assessment of architectural drawing portfolios, and semi-structured interviews with academic and professional stakeholders. The integration of these sources provided evidence from both educational and professional environments and enabled the qualitative findings to provide contextual explanations for the quantitative results.

The study was conducted within a pragmatic research paradigm, which permits the use of quantitative and qualitative approaches according to their suitability for addressing the research questions. The sequential design followed a QUAN → QUAL sequence, whereby the quantitative findings informed the areas explored during the qualitative phase.

Population of the Study

The study involved three principal population groups. The first group comprised accredited architecture programmes in Southern Nigeria. The study identified 26 architecture programmes with relevant National Universities Commission (NUC) and professional accreditation status as the broader population from which five programmes were purposively selected for curriculum analysis. The selected programmes were Obafemi Awolowo University (OAU), University of Nigeria, Nsukka (UNN), Abia State University, Enugu State University of Science and Technology (ESUT), and Covenant University. The selection was intended to provide variation in institutional and geographical contexts rather than to represent all architecture programmes in Nigeria. The second group comprised registered architectural firms operating in Lagos, the Federal Capital Territory (Abuja), Rivers State, and Enugu State. The firms were required to have an identifiable physical office and evidence of active professional practice. A sampling frame of 542 active architectural firms within the selected locations was used for the practitioner survey.

The third group comprised recent architecture graduates who had completed or were undertaking professional training under the supervision of registered architectural practitioners. Graduates within the 2019–2024 period were considered in order to obtain evidence concerning the transition from academic training to professional practice. The three population groups were selected because they provided complementary evidence concerning curriculum provision, professional expectations, and graduate drawing performance.

Sampling Procedure and Sample Size

A multistage sampling procedure was adopted for the quantitative and qualitative phases. For the curriculum component, five accredited architecture programmes were purposively selected: Obafemi Awolowo University (OAU), University of Nigeria, Nsukka (UNN), Abia State University, Enugu State University of Science and Technology (ESUT), and Covenant University. The selection was based on accessibility, institutional variation, and the need to obtain evidence from different educational settings. For the practitioner survey, the accessible population comprised registered architectural firms within Lagos, Abuja, Rivers State, and Enugu State. Based on a population of 542 firms, Yamane's (1967) formula was applied at a 7% level of precision:

n = \frac{N}{1 + N(e)^2}

Where: (n) = required sample size; (N) = population size; (e) = level of precision.

Using (N = 542) and (e = 0.07), the calculated sample was approximately 148, which was rounded to 150 firms/respondents for the study. The 150 questionnaires were distributed to selected architectural practitioners across the study locations. One principal or senior registered architect was targeted from each selected firm. A total of 132 questionnaires were returned and found usable, giving an overall response rate of 88.0%. The 132 valid responses constituted the quantitative survey sample used for analysis.

For the qualitative phase, participants were selected purposively based on their knowledge and experience of architectural education and professional practice. The qualitative component comprised 15 participants: 10 principals/senior practitioners and 5 heads of department (HoDs). These participants provided professional and academic perspectives on curriculum content, technical drawing requirements, teaching practices, digital technologies, internship experiences, and the transition from academic training to professional practice.

Research Instruments and Portfolio Assessment

Three principal research instruments were used: the

Competency and Curriculum Alignment Questionnaire (CCAC), the Drawing Assessment Rubric (DAR), and a semi-structured interview guide. Curriculum documents and architectural drawing portfolios were also analysed as documentary sources.

Competency and Curriculum Alignment Questionnaire

The CCAC was developed from the study objectives, relevant literature, professional practice requirements, and the competency areas identified in architectural education and practice. The questionnaire comprised five main sections. Section A collected information on respondents' professional and firm characteristics.
Section B assessed the level of importance that professional practitioners attached to 28 architectural drawing competencies expected of graduates entering professional practice. Respondents rated each competency on a five-point scale ranging from 1 = Not Important to 5 = Extremely Important.
Section C assessed respondents' perceptions of the level of competence demonstrated by recent architecture graduates in the same 28 competency areas. The performance scale ranged from 1 = Very Poor to 5 = Excellent. The 28 competencies were organised into four broad domains:
1. Technical Drawing and Documentation
2. Digital Drawing and Building Information Modelling (BIM)
3. Coordination, Regulations and Professional Practice
4. Design Communication and Integration

The use of the same 28 competencies in Sections B and C enabled direct comparison between professional expectations and perceived graduate performance. Section D examined factors that may contribute to the academia–practice competency gap, while Section E examined strategies for improving competency alignment. These sections used a five-point agreement scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire also contained open-ended questions to allow respondents to identify additional factors and recommendations. The complete questionnaire is provided in Appendix A.

Drawing Assessment Rubric

The Drawing Assessment Rubric (DAR) was used to assess architectural drawing portfolios. The rubric consisted of 10 assessment criteria covering technical accuracy, completeness, detailing, coordination, documentation, presentation, and buildability. The portfolio assessment comprised 50 final-year student portfolios and 30 graduate/intern portfolios. The two groups were treated as independent groups because the available portfolio records did not establish that the graduate/intern portfolios belonged to the same individuals whose work had been assessed at final year. Consequently, the portfolio comparison was used to identify differences between the two groups and not to measure individual improvement over time.

Semi-Structured Interview Guide

A semi-structured interview guide was developed to obtain qualitative explanations of the quantitative findings. The interview questions focused on curriculum emphasis, working-drawing training, BIM and digital technology, lecturer capacity, ICT resources, SIWES/internship experiences, assessment practices, industry–academia collaboration, and graduate preparedness for professional practice.
The interview component involved 15 participants comprising 10 principals/senior practitioners and 5 HoDs.

Validity and Reliability of the Instruments

The research instruments were subjected to expert review to establish their content validity. Experts with relevant knowledge of architectural education, professional practice, and research methodology reviewed the questionnaire and assessment instruments for relevance, clarity, coverage, and alignment with the study objectives. The resulting Content Validity Index (CVI) was 0.84, indicating acceptable content validity.
Reliability analysis was conducted for the questionnaire constructs. Cronbach's alpha coefficients were 0.89 for expected competency, 0.90 for perceived graduate performance, and 0.82 for factors contributing to competency gaps. These values indicate satisfactory internal consistency. The Drawing Assessment Rubric produced an inter-rater reliability coefficient of 0.81, indicating acceptable consistency among the assessors.

Data Collection Procedure

Data collection commenced after the necessary institutional permissions and ethical procedures had been completed. The questionnaires were administered to selected architectural practitioners through physical distribution and electronic means, including Google Forms. Respondents were informed about the purpose of the study and were assured that participation was voluntary. A total of 150 questionnaires were distributed, of which 132 valid responses were obtained, representing an 88.0% response rate. Curriculum documents were obtained from the five selected architecture programmes and examined to identify the extent to which architectural drawing, technical documentation, CAD, BIM, construction detailing, and professional practice requirements were represented in the curriculum.

Relevant architectural drawing portfolios were collected and assessed using the Drawing Assessment Rubric. The portfolio sample comprised 50 final-year student portfolios and 30 graduate/intern portfolios. Because the available records did not establish that the two groups represented the same individuals at different stages, the groups were analysed as independent groups. Following the quantitative analysis, semi-structured interviews were conducted with the selected academic and professional stakeholders. The qualitative component comprised 15 participants: 10 principals/senior practitioners and 5 HoDs. The interviews were used to explore and explain issues emerging from the quantitative findings, particularly competency gaps associated with BIM, technical detailing, coordination, professional standards, SIWES, teaching capacity, and institutional resources. To maintain confidentiality, participants were assigned codes during qualitative analysis, such as P1–P10 for principals/senior practitioners and H1–H5 for heads of department.

Data Analysis

Quantitative data were analysed using descriptive statistics, Relative Importance Index (RII), gap analysis, and inferential statistics.

Competency Gap Analysis

The 28 architectural drawing competencies were analysed using the Mean Expected Competency (ME) and Mean Performance (MP). The competency gap was calculated as:

Gap Score = Mean {Expected} - Mean {Performance}

A positive gap indicated that professional expectations exceeded the perceived performance of graduates, while a negative gap indicated that perceived graduate performance exceeded the reported professional expectation. The competencies were subsequently ranked according to the size of the competency gap. Gap ranking was kept separate from RII ranking to avoid confusing professional importance with the magnitude of the competency gap. The full 28-item competency results were reported to ensure that the ranking could be examined transparently.

Relative Importance Index

The Relative Importance Index was used to rank factors contributing to the competency gap and proposed strategies for improving competency alignment. The RII was calculated as:

$RII = (\sum W) / (A*N)$

Where: (W) = weighting assigned to each response; (A) = highest possible weighting, which was 5; (N) = total number of valid responses. The RII values were used to establish the relative ranking of the identified causes and proposed strategies.

Portfolio Analysis

The Drawing Assessment Rubric scores for the 50 final-year portfolios and 30 graduate/intern portfolios were summarised using means and standard deviations. An independent-samples t-test was used to determine whether the mean portfolio scores differed significantly between the two groups. The independent-samples approach was selected because the available records did not establish that the graduate/intern portfolios were produced by the same individuals whose final-year portfolios were assessed.
The analysis therefore identifies a difference between the two groups and does not constitute a longitudinal test of individual improvement.

Curriculum Content Analysis

Curriculum documents from the five selected architecture programmes were analysed to identify the presence and relative emphasis of manual drawing, CAD, BIM, technical documentation, construction detailing, multidisciplinary coordination, and professional practice-related content. The analysis was used to contextualise the competency findings from the practitioner survey and portfolio assessment.

Qualitative Data Analysis

Interview data were analysed using thematic analysis following the principles described by Braun and Clarke (2006). The process involved familiarisation with the interview data, identification of initial codes, development of themes, review of themes, definition of thematic categories, and interpretation of the findings. Participant codes were used to maintain confidentiality. For example, P1–P10 represented principals/senior practitioners, while H1–H5 represented heads of department.

Integration of Quantitative and Qualitative Findings

The mixed-methods findings were integrated using a quantitative finding → qualitative explanation → integrated interpretation approach. For example, where the quantitative analysis identified a substantial gap in Revit/BIM competency, the qualitative interviews were examined to determine whether issues such as limited lecturer capacity, inadequate ICT infrastructure, software access, or curriculum emphasis provided possible explanations. The qualitative evidence was therefore used to contextualise and explain the

Table 1: Characteristics of Practitioner Respondents.

Variable	Category	Frequency (n)	Percentage (%)
Location	Lagos	68	51.5
	Abuja	32	24.2
	Port Harcourt	18	13.6
	Enugu	14	10.6
Professional experience	10–15 years	41	31.1
	16–20 years	53	40.2
	More than 20 years	38	28.8
Firm size	1–5 staff	59	44.7
	6–15 staff	52	39.4
	More than 15 staff	21	15.9
Software use	AutoCAD + Revit	78	59.1
	AutoCAD only	41	31.1
	ArchiCAD/BIM workflow	13	9.8
Total		**132**	**100.0**

quantitative findings rather than to generate a separate set of unrelated results.

Ethical Considerations

Ethical principles were observed throughout the study. Participants were informed about the purpose of the research and were informed that participation was voluntary. Informed consent was obtained before questionnaire administration and interviews. Respondents were assured that information provided would be treated confidentially and used only for academic research purposes. Individual participants and firms were not identified in the presentation of the findings. The use of student and graduate portfolios was also subject to appropriate permission and ethical considerations. Portfolio materials were used for research assessment and were not presented in a manner that identified individual students or graduates. Interview participants were assigned codes rather than being identified by name or firm. Participation was voluntary, and participants could decline to answer questions they did not wish to answer. The study therefore sought to protect participants' privacy, maintain confidentiality, and ensure that participation did not result in adverse consequences for respondents or the institutions involved.

Methodological Scope and Limitations

The methodology should be interpreted within the scope of the selected institutions, firms, respondents, and portfolio records. The practitioner survey covered selected architectural firms in Lagos, Abuja, Rivers State, and Enugu State, while the curriculum analysis covered five architecture programmes. The findings therefore provide evidence from selected educational and professional settings and should not be interpreted as statistically representative of all architecture programmes or architectural firms in Nigeria. Similarly, the comparison of final-year and graduate/intern portfolios involved independent groups because the available records did not establish that the same individuals were assessed at both stages. Consequently, the portfolio findings should not be interpreted as evidence of individual improvement over a specified period.

The proposed Competency Alignment Framework derived from the study is also presented as a proposed framework based on the empirical findings and stakeholder perspectives. Its broader applicability and effectiveness require further empirical testing.

RESULTS

Respondent Characteristics

A total of 132 usable responses were obtained from registered architectural practitioners in the selected study locations. The respondents comprised principals and senior registered architects with substantial professional experience. As shown in Table 1, more than half of the respondents were from Lagos (68; 51.5%), followed by Abuja (32; 24.2%), Port Harcourt (18; 13.6%), and Enugu (14; 10.6%). In terms of professional experience, 41 respondents (31.1%) had between 10 and 15 years of experience, 53 (40.2%) had between 16 and 20 years, while 38 (28.8%) had more than 20 years of experience.

Regarding firm size, 59 respondents (44.7%) worked in firms with between one and five staff members, 52 (39.4%) worked in firms with six to 15 staff members, and 21 (15.9%) worked in firms with more than 15 staff members. The reported software-use profile indicates that 78 respondents (59.1%) used both AutoCAD and Revit, 41 (31.1%) reported using AutoCAD only, while 13 (9.8%) reported using ArchiCAD or a more

Table 2: Summary of Curriculum Characteristics.

Curriculum characteristic	Finding
Average studio-related credits	Approximately 68
Credits directly associated with working drawings	6
Working-drawing share of identified studio credits	Approximately 8.8%
Manual drawing provision	Present across all five programmes
CAD introduction	Generally introduced at a later stage
BIM/Revit provision	Present as elective/advanced content in some programmes
BIM provision across all five programmes	Not uniform
Explicit office-standard templates	Limited evidence
Integrated multidisciplinary coordination	Limited/variable evidence
Assessment emphasis	Greater emphasis on conceptual/design and visual components than technical documentation

Table 3: Selected Drafting Competencies and Expected–Performance Gaps.

Competency	Expected Mean (ME)	Performance Mean (MP)	Gap (ME−MP)
Complete floor plans	4.82	3.41	1.41
Sections/elevations	4.78	3.22	1.56
Roof detailing	4.71	2.54	2.17
Wet-area detailing	4.69	2.31	2.38
Stair detailing	4.58	2.67	1.91
Door/window detailing	4.55	2.89	1.66
AutoCAD	4.75	3.88	0.87
Revit/BIM	4.68	2.14	2.54
Layer management	4.52	2.21	2.31
MEP/structural coordination	4.61	1.98	2.63
ARCON-related documentation	4.48	2.45	2.03
NBC-related knowledge	4.63	2.52	2.11
Freehand drawing	3.89	4.12	−0.23
Manual orthographic drawing	3.21	3.85	−0.64

comprehensive BIM workflow. These findings indicate that conventional CAD remains widely used among the surveyed practitioners, while the extent of BIM-related software use varies across firms.

Curriculum Content and Provision of Technical Drawing

The analysis of the five selected architecture programmes revealed differences between the broader design-studio curriculum and the specific provision for working drawings and professional technical documentation. Across the programmes examined, the average number of studio-related credits was approximately 68 (Table 2), of which six credits were identified as being directly associated with working-drawing activities. This represents approximately 8.8% of the identified studio-credit provision. The curriculum review further indicated that manual drawing continued to form part of the foundational studio experience across the five programmes. CAD was generally introduced at a later stage of the programmes, while BIM-related content was identified as an elective or advanced component in some of the programmes examined. BIM content was not identified at the same level of provision across all five institutions. The review also found limited explicit evidence of common professional office standards within the curriculum documents examined. Similarly, multidisciplinary coordination involving architectural, structural, and building-services information was not consistently presented as an integrated component of studio assessment.

The curriculum findings therefore suggest that working-drawing and digital coordination competencies are present within the selected programmes but may not receive the same curricular emphasis as broader design and presentation activities.

Expected and Perceived Performance in Drafting Competencies

The practitioner survey examined 28 drafting-related competencies. Respondents rated the expected level of competency in professional practice and the perceived level demonstrated by graduates. The results indicate positive gaps across most of the technical competencies reported in Table 3. A positive gap means that practitioners' expectations were higher than their

Table 4: Portfolio Assessment Scores.

Portfolio group	Mean score	Standard deviation
Final-year portfolios	48.6	11.2
Graduate/intern portfolios	67.4	9.8

Table 5: Factors Associated with the Competency Gap.

Perceived factor	Mean	RII	Rank
Emphasis on manual approaches relative to BIM	4.51	0.902	1
Limited lecturer BIM expertise	4.43	0.886	2
Inadequate ICT/software resources	4.38	0.876	3
Weak SIWES/logbook structure	4.21	0.842	4
Assessment emphasis on aesthetics/buildability	4.15	0.830	5
Limited industry–academia interaction	4.02	0.804	6

assessment of graduate performance. The largest reported gaps among the selected competencies occurred in multidisciplinary coordination, Revit/BIM, wet-area detailing, and layer management. The gap for MEP/structural coordination was 2.63, followed by Revit/BIM at 2.54, wet-area detailing at 2.38, and layer management at 2.31. Other substantial differences were reported for roof detailing, regulatory documentation, NBC-related knowledge, stair detailing, door and window detailing, and sections/elevations. By contrast, freehand drawing and manual orthographic drawing produced negative gaps. The reported gap for freehand drawing was −0.23, while manual orthographic drawing recorded −0.64. These negative values indicate that perceived performance exceeded the reported expected level for those particular competencies.

Note: The table presents selected competencies from the broader 28-item instrument. The complete 28-item competency table should be included in the final manuscript or an appendix so that all competency rankings can be evaluated.

The results demonstrate a clear pattern: the largest perceived differences occur mainly in competencies associated with technical documentation, digital workflows, and multidisciplinary coordination, whereas the two reported manual drawing competencies show no negative performance gap.

Portfolio Assessment

Portfolio assessment provided additional evidence of differences in technical drawing performance between students at graduation and those represented in graduate/intern practice portfolios (Table 4). The 50 final-year portfolios recorded a mean score of 48.6 out of 100, with a standard deviation of 11.2, while the 30 graduate/intern portfolios recorded a mean score of 67.4, with a standard deviation of 9.8. The difference between the two group means was 18.8 points. An independent-samples t-test indicated that the difference was statistically significant ($t = 7.82$, $p < 0.001$). The result indicates that the graduate/intern portfolio group demonstrated significantly higher levels of drawing performance than the final-year group. However, because the portfolios were not confirmed to represent the same individuals at two different points in time, the finding should not be interpreted as evidence of longitudinal improvement among the same graduates.

Factors Associated with the Competency Gap

Six major factors were identified from the practitioner responses. The continued relative emphasis on manual methods compared with BIM recorded the highest importance (Mean = 4.51; RII = 0.902), followed by limited lecturer capacity in BIM (Mean = 4.43; RII = 0.886), inadequate ICT/software resources (Mean = 4.38; RII = 0.876), weak SIWES structures and logbook monitoring (Mean = 4.21; RII = 0.842), assessment practices that emphasise aesthetics and presentation over buildability (Mean = 4.15; RII = 0.830), and limited industry–academia collaboration (Mean = 4.02; RII = 0.804) (Table 5). These results suggest that the competency gap is associated with a combination of curriculum emphasis, teaching capacity, resource limitations, industry exposure, assessment practices, and the strength of relationships between academic institutions and professional practice.

Proposed Strategies for Improving Competency Alignment

The strategies receiving the highest levels of practitioner support were mandatory BIM/Revit training (RII = 0.942), the use of standard office drawing templates (0.924), structured SIWES arrangements (0.916), improved lecturer capacity in BIM (0.910), practitioner-led studio activities (0.898), increased emphasis on working drawings (0.882), improved ICT resources (0.876), curriculum and competency audits (0.864), development

Table 6: Strategies for Improving Competency Alignment.

Strategy	Mean	RII	Rank
Earlier mandatory BIM/Revit training	4.71	0.942	1
Standard office templates/documentation standards	4.62	0.924	2
Structured SIWES with professional logbook	4.58	0.916	3
Lecturer BIM capacity development	4.55	0.910	4
Practitioner-led studio activities	4.49	0.898	5
Increased working-drawing credits	4.41	0.882	6
Improved ICT/software facilities	4.38	0.876	7
Periodic curriculum/professional audit	4.32	0.864	8
Nigerian standard-detail resources	4.28	0.856	9
Joint architectural/structural/MEP studio	4.25	0.850	10

of contextually relevant Nigerian technical-detail libraries (0.856), and joint civil/MEP coordination exercises (0.850) (Table 6).

Overall, the results indicate a substantial mismatch between several competencies expected in professional architectural practice and the level of competence reported among graduates. The most prominent gaps concerned MEP/structural coordination, Revit/BIM, wet-area detailing, and layer management. Curriculum analysis further indicated relatively limited explicit emphasis on working drawings, while BIM provision varied among the selected programmes. The portfolio comparison also showed significantly higher scores among the graduate/intern group than among the final-year group. The findings point to the need for stronger curriculum–practice alignment, improved digital capacity, structured professional exposure, and closer collaboration between architectural schools and industry.

DISCUSSION

Nature of the Academic–Professional Competency Gap

The findings demonstrate a clear disjuncture between the competencies expected in professional architectural practice and the competencies observed among graduates. The largest gaps were recorded in MEP/structural coordination (2.63), Revit/BIM (2.54), wet-area detailing (2.38), and layer management (2.31). These findings are consistent with concerns in the literature regarding the alignment of architectural education with changing professional requirements and digital modes of practice (Afolabi et al., 2023; Opoko et al., 2022; Saka et al., 2024). The negative gaps recorded for freehand drawing and manual orthographic drawing indicate that students may perform relatively well in traditional drawing activities compared with the expectations reported by practitioners. This does not imply that manual drawing is no longer relevant. Rather, it suggests that the stronger performance in traditional skills is not matched by comparable competence in some technical, coordination, and digital documentation skills required in contemporary practice.

Curriculum Emphasis and Working-Drawing Preparation

Curriculum analysis showed that approximately 6 of 68 studio-related credits, representing 8.8%, were explicitly devoted to working drawings across the selected programmes. Manual drawing was present across all five programmes, while CAD was generally introduced at later stages and BIM provision was not uniform (Table 2). This pattern suggests that curriculum structures may continue to place substantial emphasis on design representation and traditional drawing while providing comparatively less structured exposure to professional documentation and multidisciplinary coordination. Similar concerns regarding the relationship between architectural education, curriculum content, and professional practice have been reported in previous studies (Adegbile, 2012; Adeyemi and Oluwatayo, 2021; Afolabi et al., 2023).

Digital Competency and BIM Preparedness

Revit/BIM recorded a substantial competency gap of 2.54. However, the findings should not be interpreted as indicating that software knowledge alone constitutes BIM competence. BIM involves information management, coordination, collaborative workflows, and integrated project processes in addition to proficiency with specific software platforms (Eastman et al., 2020; Succar and Kassem, 2022; Saka and Chan, 2020). The findings therefore suggest the need for architectural education to move beyond isolated software instruction towards more integrated digital documentation and coordination exercises.

Technical Detailing and Multidisciplinary Coordination

MEP/structural coordination, wet-area detailing, and roof detailing recorded some of the largest competency gaps. These findings indicate that graduates may require

greater exposure to the technical relationships between architectural drawings and other building systems. Similar concerns about the practical and technical dimensions of architectural education have been identified in previous Nigerian studies (Oluwatayo and Pirisola, 2020; Tunji-Olayeni et al., 2023). The results do not, however, establish that these competency gaps directly cause construction defects or project failures. Rather, they identify areas in which additional education and professional exposure may be beneficial.

Professional Standards and Regulatory Knowledge

Knowledge of ARCON requirements and the Nigerian Building Code also showed positive competency gaps of 2.03 and 2.11 respectively. This suggests that greater integration of regulatory requirements into drawing exercises may be necessary. Regulatory knowledge is particularly important because professional documentation requires drawings to satisfy technical, statutory, and approval requirements rather than merely present design ideas (ARCON, 2020; Federal Government of Nigeria, 2023).

Role of Teaching Capacity and Educational Resources

Limited lecturer capacity in BIM and inadequate ICT/software resources were among the leading factors identified by practitioners. These findings reinforce the importance of staff development and adequate technological infrastructure in supporting digital architectural education. Previous studies have similarly identified technology adoption, staff capacity, and institutional resources as important considerations in BIM-oriented education (Hanna, 2022; Olanrewaju et al., 2022; Saka et al., 2024).

SIWES and the Transition to Professional Practice

Weak SIWES structures and logbook monitoring recorded an RII of 0.842. The finding suggests that industrial attachment may not consistently provide the structured learning opportunities required to connect classroom knowledge with professional drawing production. Strengthening supervision, learning objectives, documentation, and communication between schools and host firms could improve the educational value of SIWES.

Assessment Practices and the Academic–Practice Divide

The respondents also identified assessment practices that emphasise aesthetics and conceptual output relative to buildability as a contributor to the competency gap. This finding raises an important issue concerning what students are encouraged to prioritise. Architectural education necessarily values creativity, conceptual development, visual communication, and design quality. However, if technical accuracy, buildability, coordination, and documentation receive comparatively limited assessment attention, students may rationally devote more effort to the areas that have the greatest influence on their academic grades. Assessment therefore has the potential to influence the competencies students develop. Aligning assessment criteria more closely with professional expectations could encourage students to treat technical documentation as an integral part of architectural design rather than as a secondary exercise. This approach is consistent with competency-based education, which emphasises demonstrable performance rather than exposure to content alone (Mulder, 2014). It also supports the broader argument for strengthening the relationship between architectural education and professional practice (Opoko et al., 2022; Afolabi et al., 2023).

Portfolio Evidence and Transition into Practice

The portfolio assessment revealed a difference between the mean scores of the final-year portfolio group (48.6) and the graduate/intern portfolio group (67.4). The higher mean for the latter group suggests that exposure to professional practice may be associated with stronger technical drawing performance. However, the available study design does not permit a definitive conclusion that professional practice itself caused the improvement. The portfolio groups and their relationship to one another must first be clearly established. If the same individuals were assessed at graduation and subsequently in practice, a repeated-measures approach would be appropriate. If different individuals were assessed, the result should be interpreted as a difference between groups rather than longitudinal improvement. Nevertheless, the finding is consistent with the broader literature suggesting that practical exposure can contribute to the development of professional competencies (Oluwatayo and Pirisola, 2020; Tunji-Olayeni et al., 2023). It reinforces the potential value of structured work-based learning and stronger connections between academic studios and professional firms.

Industry–Academia Collaboration

Limited industry–academia interaction was identified by practitioners as a contributor to the competency gap, with an RII of 0.804. This result indicates that respondents considered the relationship between educational institutions and professional practice relevant to graduate preparedness. Industry involvement can take several forms, including practitioner-led studio sessions, portfolio reviews, professional critiques,

mentorship, curriculum consultation, joint projects, and workplace placements. Such interaction can expose students to current professional expectations while allowing academic institutions to receive feedback about changes in practice. However, industry participation should complement rather than replace academic teaching. Universities remain responsible for developing broader intellectual, theoretical, creative, ethical, and analytical capacities. The objective should therefore be a productive relationship between academic knowledge and professional experience.

Proposed Competency Alignment Framework

Based on the findings, the study proposes a four-pillar Competency Alignment Framework consisting of:

1. Curriculum Reform – strengthening technical documentation, digital drafting, BIM, and multidisciplinary coordination within architectural education;
2. Capacity Building – improving lecturer competence, ICT infrastructure, and access to appropriate digital tools;
3. Structured Work-Based Learning – strengthening SIWES through clearer competencies, professional tasks, supervision, and assessment; and
4. Industry–Academia Partnership – increasing meaningful interaction between architectural schools and professional practice.

These four areas correspond broadly with the principal issues identified through the questionnaire, curriculum analysis, portfolio assessment, and interviews. The framework should be regarded as a proposed competency-alignment model rather than a fully validated national framework. The reported consultation with practitioners provides evidence of stakeholder acceptance, but stronger validation would require testing the framework with a larger and more diverse group of educational institutions, professional bodies, employers, and graduates.

Implications for Architectural Education and Practice

The findings have several implications for architectural education in Nigeria. First, curriculum development should consider the balance between conceptual design and technical documentation. The objective should not be to reduce design education but to ensure that graduates can translate design intentions into coordinated and professionally usable information. Second, digital competency should be treated as an integrated educational outcome. BIM and other digital tools should be connected to design development, technical documentation, coordination, and professional workflows rather than taught only as isolated software skills. Third, staff development is important. Curriculum changes that introduce new digital competencies will have limited effect if lecturers do not have the opportunity to acquire and maintain relevant knowledge. Fourth, SIWES and other industry-placement arrangements should have clearer learning objectives and mechanisms for monitoring student development. Stronger links between universities and professional firms can help ensure that students encounter realistic professional requirements before graduation. Finally, assessment methods should reflect the competencies graduates are expected to demonstrate in practice. Technical accuracy, buildability, documentation quality, digital competency, and coordination should receive appropriate attention alongside creativity and design quality.

Overall, the findings indicate that the academic–professional divide in architectural drafting is best understood as an alignment problem involving curriculum content, teaching capacity, digital resources, assessment, work-based learning, and industry engagement. Addressing these interconnected dimensions may improve the transition from architectural education to professional practice.

Limitations of the Study

The findings should be interpreted in light of several limitations. First, the study focused on selected architecture programmes and architectural firms in Lagos, Abuja, Port Harcourt, and Enugu. The findings should therefore not be assumed to represent every architecture programme or architectural practice in Nigeria. Second, the practitioner survey relied substantially on respondents' perceptions of graduate competency. Although these perceptions provide valuable evidence of professional expectations, they do not constitute a complete objective measurement of every graduate's technical ability. Third, the portfolio component involved selected portfolios rather than a nationally representative sample. The interpretation of differences between the final-year and graduate/intern groups is also dependent on clarification of the sampling relationship between the groups. Fourth, the study's cross-sectional survey design limits the extent to which causal relationships can be established. Associations between curriculum conditions, institutional factors, and competency outcomes should therefore not be interpreted as definitive causal effects. Finally, the proposed Competency Alignment Framework requires further testing and validation across a wider range of institutions and professional settings before it can be considered a general framework for architectural education in Nigeria.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the disjuncture between academic

drafting competencies and professional practice requirements in architecture in Nigeria using quantitative survey data, curriculum analysis, portfolio assessment, and qualitative evidence. The findings demonstrate substantial gaps in several competencies expected in professional practice, particularly MEP/structural coordination, Revit/BIM, wet-area detailing, and layer management. The curriculum analysis showed that only approximately 8.8% of studio-related credits were explicitly devoted to working drawings across the selected programmes. Although traditional manual drawing remained strongly represented, provision for BIM and advanced digital documentation varied across institutions. The findings also identified limited lecturer capacity in BIM, inadequate ICT/software resources, weak SIWES structures, assessment practices that may place greater emphasis on presentation than buildability, and limited industry–academia collaboration as important factors associated with the observed competency gap. The portfolio analysis further showed that the graduate/intern group recorded significantly higher drawing scores than the final-year group ($t = 7.82$, $p < 0.001$). Because the groups were not established as the same individuals assessed at different points in time, the result is interpreted as a difference between groups rather than evidence of measured longitudinal improvement. The study therefore concludes that greater alignment is needed between architectural education and the technical, digital, regulatory, and coordination competencies required in professional practice. In response, the study proposes a four-pillar Competency Alignment Framework based on curriculum reform, capacity building, structured industry experience, and stronger industry–academia partnerships. The framework provides a basis for further empirical evaluation rather than a conclusively validated model.

Recommendations

Based on the findings, the following recommendations are proposed.

1. Architectural programmes should strengthen technical documentation. Working drawings, detailing, multidisciplinary coordination, regulatory requirements, and constructability should receive greater and more structured attention within studio and technical courses.
2. BIM and digital competencies should be integrated more systematically. BIM should be taught not merely as software operation but through coordinated documentation, information management, interdisciplinary collaboration, and project-based exercises (Eastman et al., 2020; Saka & Chan, 2020).
3. Lecturer capacity should be strengthened. Institutions should provide opportunities for academic staff to update their knowledge of BIM, digital documentation, current professional workflows, and emerging technologies.
4. SIWES should be more deliberately structured. Learning objectives, supervision, logbook requirements, assessment, and communication between institutions and host firms should be strengthened so that industrial attachment provides meaningful professional learning.
5. Industry–academia collaboration should be expanded. Professional practitioners should be involved in curriculum review, studio activities, portfolio assessment, mentoring, and discussions of current professional requirements.
6. Assessment practices should reflect professional competency. In addition to design quality and presentation, assessment should consider technical accuracy, detailing, coordination, documentation completeness, regulatory compliance, and buildability.
7. Institutions should strengthen digital and technical resources. Appropriate ICT infrastructure, software access, drawing standards, technical libraries, and learning resources should be provided to support contemporary architectural education.
8. Professional and regulatory bodies should support periodic competency review. Curriculum and professional competency expectations should be reviewed periodically to reflect changes in technology and professional practice (ARCON, 2020; NUC, 2022).
9. The proposed framework should be empirically evaluated. Future implementation should be accompanied by systematic assessment to determine whether the proposed interventions improve graduate competencies and professional readiness.

Suggestions for Future Research

Future studies should extend the investigation to a larger and more geographically diverse sample of architecture programmes and professional firms across Nigeria. Longitudinal research could follow architecture students from their final year through their early years of professional practice to examine how specific competencies develop over time. Future research should also use direct performance-based assessments alongside practitioner perceptions. This could include standardised drawing tasks, BIM modelling exercises, technical-detail assessments, and multidisciplinary coordination exercises. Studies could examine the relationship between specific curriculum interventions and graduate outcomes. In particular, research could evaluate whether earlier BIM exposure, structured SIWES, practitioner-led studios, or revised assessment criteria produce measurable improvements in technical competency. Such research would provide stronger empirical evidence for determining which interventions are most effective in reducing the academic–professional competency gap in Nigerian architectural education.

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Appendix

QUESTIONNAIRE

ASSESSING THE DISJUNCTURE BETWEEN ACADEMIC DRAFTING COMPETENCIES AND PROFESSIONAL PRACTICE REQUIREMENTS IN ARCHITECTURE IN NIGERIA

Dear Respondent,

I am conducting a research study on the relationship between architectural education and the technical drawing competencies required for professional architectural practice in Nigeria.
The purpose of this questionnaire is to identify the competencies expected of architecture graduates, assess the level of competency demonstrated by recent graduates, identify factors contributing to any competency gaps, and obtain suggestions for improving the alignment between architectural education and professional practice.
Your responses will be used strictly for academic purposes. All information provided will be treated confidentially and will not be used to identify individual respondents.
There are no right or wrong answers. Please answer each question based on your professional experience and honest assessment.
Thank you for your valuable contribution.

SECTION A: RESPONDENT AND PROFESSIONAL INFORMATION

Please tick (✓) the option that best describes your response.

A1. Professional role

☐ Principal/Managing Architect
☐ Senior Architect
☐ Project Architect
☐ Other: _____

A2. Years of professional experience

☐ Less than 5 years
☐ 5–9 years
☐ 10–15 years
☐ 16–20 years
☐ More than 20 years

A3. Location of practice

☐ Lagos
☐ Abuja
☐ Port Harcourt
☐ Enugu
☐ Other: _____

A4. Size of your architectural firm

☐ 1–5 staff
☐ 6–15 staff
☐ More than 15 staff

A5. Highest professional/academic qualification

☐ B.Arch/B.Sc. Architecture
☐ M.Arch/M.Sc. Architecture
☐ PhD
☐ Other: _____

A6. Are you currently involved in supervising or mentoring architecture graduates/interns?

☐ Yes
☐ No

A7. Which drawing/BIM software is predominantly used in your practice?

☐ AutoCAD
☐ AutoCAD + Revit
☐ ArchiCAD/BIM workflow
☐ Other: _____

SECTION B: EXPECTED ARCHITECTURAL DRAWING COMPETENCIES

Please indicate the level of importance of each competency for a graduate entering professional architectural practice.
Scale:
1=Not Important
2=Slightly Important
3=Moderately Important
4=Very Important
5 = Extremely Important

NO.	Competency	1	2	3	4	5
B1	Preparation of complete floor plans					
B2	Preparation of building sections and elevations					
B3	Roof plans and roof construction detailing					
B4	Wet-area detailing, including toilets and bathrooms					
B5	Staircase design and detailing					
B6	Door and window detailing/scheduling					
B7	Preparation of working drawings suitable for construction					
B8	Dimensioning, annotation and drawing conventions					
B9	Preparation of schedules and drawing notes					
B10	Construction/detail drawings					
B11	Architectural detailing of building components					
B12	Interpretation and application of construction information					
B13	AutoCAD proficiency					
B14	Revit/BIM proficiency					
B15	Drawing-layer management and organization					
B16	Drawing templates and office drawing standards					
B17	Coordination of architectural drawings with structural drawings					
B18	Coordination of architectural drawings with mechanical/electrical/plumbing (MEP) services					
B19	Preparation and interpretation of site/building information					
B20	Application of building regulations and standards					
B21	Knowledge and application of ARCON requirements					
B22	Knowledge and application of the Nigerian Building Code (NBC)					
B23	Preparation of drawings for statutory approval					
B24	Drawing revision, checking and quality control					
B25	Freehand/sketch drawing for design communication					
B26	Manual orthographic drawing					
B27	Three-dimensional visualisation and presentation of design information					
B28	Multidisciplinary coordination and communication of drawing information					

SECTION C: ASSESSMENT OF RECENT ARCHITECTURE GRADUATES' PERFORMANCE

Based on your experience with recent architecture graduates/interns, please rate their typical level of competence in each of the following areas.
Scale:
1=Very poor
2=Poor
3=Moderate
4=Good
5 = Excellent

NO.	Competency	1	2	3	4	5
C1	Preparation of complete floor plans					
C2	Preparation of building sections and elevations					
C3	Roof plans and roof construction detailing					
C4	Wet-area detailing, including toilets and bathrooms					
C5	Staircase design and detailing					
C6	Door and window detailing/scheduling					
C7	Preparation of working drawings suitable for construction					
C8	Dimensioning, annotation and drawing conventions					
C9	Preparation of schedules and drawing notes					
C10	Construction/detail drawings					
C11	Architectural detailing of building components					
C12	Interpretation and application of construction information					
C13	AutoCAD proficiency					
C14	Revit/BIM proficiency					
C15	Drawing-layer management and organisation					
C16	Drawing templates and office drawing standards					
C17	Coordination of architectural drawings with structural drawings					
C18	Coordination of architectural drawings with mechanical/electrical/plumbing (MEP) services					
C19	Preparation and interpretation of site/building information					
C20	Application of building regulations and standards					
C21	Knowledge and application of ARCON requirements					
C22	Knowledge and application of the Nigerian Building Code (NBC)					
C23	Preparation of drawings for statutory approval					
C24	Drawing revision, checking and quality control					
C25	Freehand/sketch drawing for design communication					
C26	Manual orthographic drawing					
C27	Three-dimensional visualisation and presentation of design information					
C28	Multidisciplinary coordination and communication of drawing information					

SECTION D: FACTORS CONTRIBUTING TO THE ACADEMIA–PRACTICE COMPETENCY GAP

Please indicate your level of agreement with each statement.
Scale:
1=Strongly Disagree
2=Disagree
3=Neutral
4=Agree
5 = Strongly Agree

No.	Statement	1	2	3	4	5
D1	Architecture education places greater emphasis on manual drawing than on current digital/BIM workflows..					
D2	Some architecture lecturers have limited practical experience with current BIM technologies.					
D3	Inadequate computer facilities and software access affect students' digital drawing competency.					
D4	Students do not receive sufficient practical exposure during SIWES/internship placements.					
D5	Architecture assessment places greater emphasis on aesthetics and presentation than technical buildability.					
D6	There is insufficient collaboration between architecture schools and professional architectural firms.					
D7	Students receive insufficient exposure to multidisciplinary coordination with engineers and other professionals.					
D8	Students receive insufficient training in professional office drawing standards and templates.					
D9	Students have inadequate exposure to building approval and statutory documentation procedures.					
D10	Limited access to current construction details affects students' working-drawing competence.					
D11	Other factors					

Please identify any other factor that you believe contributes to the gap:

SECTION E: STRATEGIES FOR IMPROVING COMPETENCY ALIGNMENT
Please indicate your level of agreement with the following strategies.
Scale:
1=Strongly Disagree
2=Disagree
3=Neutral
4=Agree
5 = Strongly Agree

No.	Proposed strategy	1	2	3	4	5
E1	BIM/Revit should be more systematically integrated into architecture education.					
E2	Architecture programmes should incorporate professional office drawing templates and standards.					
E3	SIWES/internship should provide structured exposure to working drawings and professional documentation.					
E4	Architecture lecturers should receive continuing professional development in BIM and current digital technologies.					
E5	Practising architects should participate more actively in studio teaching and technical reviews.					
E6	More emphasis should be placed on working drawings and technical documentation within architecture curricula.					
E7	Architecture schools should improve access to computers, relevant software and digital learning resources.					
E8	Architecture programmes should periodically review their curricula against current professional practice requirements.					
E9	Schools should develop locally relevant libraries of Nigerian construction details and working-drawing examples.					
E10	Architecture students should receive more opportunities to coordinate drawings with civil, structural and MEP professionals.					
E11	Other recommended strategies					

Please state any additional strategy you consider important:

SECTION F: OPEN-ENDED PROFESSIONAL COMMENTS

F1. In your opinion, what is the most important technical drawing competency that architecture graduates currently lack?
F2. What should architecture schools do to better prepare graduates for professional drawing practice?
F3. What role should architectural firms and practising architects play in improving graduate competency?
F4. Any additional comments?

Thank you for your participation.

Your contribution is highly appreciated.