PLASU Journal of Environmental Sciences, E-ISSN 2360-9222, Vol.2, No. 2, June 2026, Published by the Faculty of Environmental Sciences, Plateau State University, Bokkos. https://www.pjes.ng
DOI: 10.5281/zenodo.21197874

DEVELOPING TECHNICAL WRITING COMPETENCY IN ARCHITECTURAL EDUCATION: RETHINKING CURRICULUM FOR PROFESSIONAL PRACTICE

[1]Dawurung Racheal Philemon [2]Dang Jim Dahmawur [3]Davou Mark Yohanna [4]Kazeh Joseph Ashi
[1,2.3,4] Department of Architecture, Plateau State University, Bokkos, Plateau State, Nigeria
Corresponding Author's Email: dawurungracheal@plasu.edu.ng
ORCID: 0009-0006-2658-1482

ABSTRACT
Technical writing is a fundamental professional competency in architectural practice, underpinning the preparation of specifications, contract documentation, technical reports, and Building Information Modelling (BIM)-based project information. Architectural education, however, continues to prioritise visual communication and studio-based learning, with comparatively limited attention to structured technical writing instruction. This study presents a critical integrative literature review examining the development of technical writing competency within architectural education. Evidence from architecture and cognate disciplines was synthesised to explore five themes: technical writing as a professional competency; architectural documentation and writing genres; curriculum and assessment challenges; pedagogical approaches adopted in related professions; and the implications of digital technologies and generative artificial intelligence (AI) for writing instruction. The review indicates that technical writing is largely treated as an implicit outcome of architectural training rather than an explicitly developed competency, with specification writing receiving particularly limited curricular emphasis relative to its professional and legal significance. Drawing on these findings, the paper proposes a Six-Layer Technical Writing Competency Framework for Architectural Education to support curriculum integration and progressive competency development. The study recommends embedding discipline-specific technical writing throughout architectural curricula using authentic assessment, studio integration, portfolio-based learning, and responsible AI literacy. It further identifies the need for empirical validation of the proposed framework and greater research within African architectural education.

Keywords: Architectural education; technical writing; specification writing; curriculum development; professional competency; Building Information Modelling

1. INTRODUCTION
Architectural practice depends on the integration of visual and written communication. While drawings and digital models communicate spatial and formal intent, written documentation conveys the technical, contractual, and regulatory information required to translate design into construction. Specifications, technical reports, site instructions, contract documents, and Building Information Modelling (BIM)-embedded information all rely on clear, accurate, and unambiguous technical writing, making it a core professional competency that supports construction quality, project coordination, regulatory compliance, and dispute resolution (O'Sullivan, 2013; Nahri, Pinquié, Véron, Bus, & Thorel, 2025; NBS, 2025).
Technical writing remains underrepresented within architectural education, notwithstanding its professional importance. Studio pedagogy has traditionally prioritised visual thinking, drawing, and design problem-solving, while written communication is often assumed to develop implicitly through project work and professional experience rather than through

explicit, scaffolded instruction (Schön, 1983, 1987). Consequently, graduates may possess strong design capabilities but comparatively weaker competencies in preparing the professional documents required in practice.

This gap has important implications. Poorly prepared specifications and contract documents have been linked to construction errors, project delays, contractual disputes, increased costs, and reduced project quality (Conspectus Inc., 2018; PMWeb, 2023; Long International, 2024). The growing adoption of BIM further reinforces the importance of technical writing, as contemporary digital workflows integrate structured textual information with graphical models, making documentation quality essential for both human communication and digital interoperability (Nahri et al., 2025).

Evidence also suggests that communication-related competencies remain less developed than design competencies among many architecture graduates (Maina, 2018; Maina & Salihu, 2016). By contrast, disciplines such as engineering, medicine, and law increasingly embed discipline-specific writing within their curricula through authentic assessment, writing-across-the-curriculum initiatives, and competency-based instruction, demonstrating that professional writing can be systematically developed rather than acquired incidentally (McLeod & Soven, 2000; Russell, 1991; Eng et al., 2024).

Although scholarship on communication in architecture has expanded, relatively little research examines technical writing as a distinct area of inquiry. Existing studies largely focus on design communication, graduate employability, or generic communication skills, while architecture-specific technical writing, particularly specification writing and professional documentation, remains underexplored. Empirical evidence from African architectural education is similarly limited, restricting understanding of how technical writing competencies are developed across different educational contexts.

Against this background, this study presents a critical integrative review of literature on technical writing competency in architectural education. It synthesises evidence from architecture and related professional disciplines to examine technical writing as a professional competency, identifies curriculum and assessment gaps, evaluates transferable pedagogical approaches, and considers the implications of digital technologies and generative AI. Based on this synthesis, the study proposes a Six-Layer Technical Writing Competency Framework for Architectural Education to support curriculum development and guide future empirical research.

The study aims to critically review the literature on technical writing competency in architectural education and identify evidence-informed strategies for strengthening professional communication within architectural curricula. Specifically, it: examines technical writing as a professional competency in architecture and related disciplines; identifies the principal technical writing competencies required in contemporary architectural practice, with particular emphasis on specification writing; analyses curriculum and assessment factors influencing technical writing development; evaluates pedagogical approaches from cognate disciplines applicable to architecture; and proposes a conceptual framework to support curriculum integration.

2. LITERATURE REVIEW

2.1 Technical Writing as a Professional Competency

Technical writing is increasingly recognised as a discipline-specific professional competency rather than a general communication skill. Unlike academic writing, it requires practitioners to communicate specialised knowledge accurately, clearly, and purposefully within the

conventions of their profession (Russell, 1991). Across engineering, medicine, and law, written communication is embedded within competency frameworks because professional documents influence technical decisions, accountability, and public safety.

Architecture reflects this relationship between technical knowledge and professional communication. Architects routinely prepare specifications, design reports, feasibility studies, contract documents, site instructions, and BIM-based documentation that communicate design intent to clients, consultants, contractors, and regulatory authorities. These documents define materials, performance requirements, contractual obligations, and regulatory compliance, complementing the information conveyed through drawings (O'Sullivan, 2013; NBS, 2025).

Despite these demands, technical writing remains relatively underemphasised in architectural education. Studio-based learning has traditionally privileged visual communication, with written documentation often regarded as supporting material rather than a competency requiring structured instruction. Consequently, many programmes assume that technical writing develops through design projects and professional experience, despite evidence from other professions that writing competency is more effectively developed through explicit, discipline-integrated instruction (Russell, 1991; McLeod & Soven, 2000).

The increasing adoption of BIM further reinforces the importance of technical writing. Contemporary digital workflows integrate structured textual information with graphical models, requiring documentation that supports both professional communication and digital information management. Technical writing should therefore be regarded as an essential professional competency underpinning effective architectural practice.

2.2 Technical Writing Genres in Architecture

Architectural practice relies on diverse forms of technical documentation that fulfil contractual, regulatory, managerial, and communicative functions throughout the project lifecycle. Collectively, these genres demonstrate that written communication is integral to architectural decision-making rather than supplementary to visual representation.

Among these, specifications are the profession's primary technical writing genre. They translate design intent into enforceable construction requirements by defining materials, workmanship, performance standards, quality requirements, and methods of execution (O'Sullivan, 2013; NBS, 2025). Preparing specifications requires professional judgement because architects must determine appropriate descriptive, performance, reference-standard, or proprietary approaches depending on project requirements.

Architects also prepare design reports, feasibility studies, technical narratives, site instructions, inspection reports, meeting minutes, and contract documentation. These documents communicate technical analyses, justify design decisions, record construction activities, and establish contractual responsibilities. Their effectiveness depends on clarity, accuracy, and consistency, since ambiguity can contribute to disputes, delays, and increased project costs (Long International, 2024).

Digital technologies have further expanded the scope of technical writing. Within BIM environments, textual information is integrated directly into digital models through descriptions of materials, performance criteria, maintenance requirements, and coordination notes. Consequently, writing quality increasingly influences information management, interoperability, and automated project coordination (Nahri et al., 2025).

These genres collectively demonstrate that technical writing spans the entire architectural project lifecycle and should therefore be developed progressively throughout architectural education.

2.3 Challenges Affecting Technical Writing Competency

The literature identifies several interconnected factors that constrain the development of technical writing competency in architectural education.

The most significant challenge is the limited integration of technical writing within architectural curricula. Although students prepare reports, dissertations, and design documentation, professional writing is often treated as an implicit outcome of studio education rather than an explicit learning objective. Consequently, students receive limited instruction in producing professional documents such as specifications, site reports, and contractual correspondence (Russell, 1991; McLeod & Soven, 2000).

A second challenge is the separation between technical knowledge and written communication. Courses in construction, structures, and building services frequently emphasise technical content without requiring students to communicate that knowledge through authentic professional documentation. Similar concerns have been reported in engineering education, where communication tasks disconnected from disciplinary learning reduce students' appreciation of writing as a professional competency (Milke, Upton, Koorey, O'Sullivan, & Comer, 2013).

Institutional constraints further limit writing development. Large studio classes, intensive workloads, and crowded curricula reduce opportunities for iterative writing practice and formative feedback. In addition, limited exposure to professional standards, building codes, and contractual documentation leaves many graduates underprepared for professional writing tasks.

Emerging digital technologies present both opportunities and challenges. BIM requires architects to produce increasingly structured digital documentation, while generative AI offers support for drafting and editing but also raises concerns regarding originality, technical accuracy, critical thinking, and academic integrity (Bittle & El-Gayar, 2025; Kofinas, Tsay, & Pike, 2025). These developments suggest that AI literacy should complement rather than replace technical writing instruction.

Overall, technical writing deficiencies reflect broader curriculum and institutional issues rather than students' writing ability alone. This points to the need for curriculum reform that better integrates writing instruction.

2.4 Lessons from Other Professional Disciplines

Engineering, medicine, and law provide useful models for developing discipline-specific technical writing because each profession requires practitioners to produce specialised documents that support professional decision-making, accountability, and public safety. Rather than treating writing as a generic academic skill, these disciplines increasingly embed communication within disciplinary learning through authentic workplace tasks, competency-based assessment, and continuous feedback.

Engineering education has widely adopted Writing Across the Curriculum (WAC) and Writing in the Disciplines (WID), integrating laboratory reports, design documentation, client reports, and reflective writing throughout technical coursework (Russell, 1991; McLeod & Soven, 2000). Similarly, medical education develops documentation skills through authentic clinical records and case-based assessment, recognising that accurate written communication is essential for patient care and professional accountability (Eng et al., 2024). Legal education

likewise integrates drafting across substantive courses because professional competence depends on precise legal writing as much as legal reasoning.

Across these disciplines, several common principles emerge. Technical writing is developed progressively throughout the curriculum, connected with authentic professional tasks, assessed for disciplinary accuracy as well as language quality, and strengthened through repeated feedback. These approaches contrast with many architectural programmes, where written documentation often receives less structured attention than visual communication. Rather than importing other disciplines' models directly, architectural education can adapt these principles to complement its studio-based pedagogy and project-centred learning.

2.5 Curriculum Approaches for Developing Technical Writing Competency

The literature consistently indicates that technical writing develops most effectively when embedded within disciplinary learning rather than taught as a stand-alone communication course. Accordingly, curriculum reform in architectural education should focus on integrating professional writing throughout existing courses instead of introducing isolated writing modules.

Writing Across the Curriculum and Writing in the Disciplines provide a foundation for this integration by embedding discipline-specific writing within technical subjects (McLeod & Soven, 2000; Russell, 1991). In architecture, this approach allows students to develop specifications, technical reports, construction documentation, and BIM-based information alongside building technology, structures, environmental systems, and professional practice.

Studio-based learning offers an ideal context for authentic writing because it already mirrors professional design practice. Expanding studio assessment to include design reports, specification extracts, technical justifications, and construction documentation would strengthen the relationship between design thinking and professional communication.

Portfolio assessment further supports progressive competency development by enabling students to compile and refine professional documents across multiple courses while receiving continuous formative feedback (Milke et al., 2013). Authentic assessment reinforces this process by requiring students to prepare documents that reflect workplace practice, including specifications, consultant reports, site records, and client correspondence.

Recent technological developments further extend curriculum requirements. BIM has transformed documentation into a collaborative digital process, while generative AI requires graduates to develop critical evaluation skills alongside writing proficiency. Consequently, technical writing education should incorporate responsible AI use, emphasising verification, technical accuracy, ethical practice, and professional judgement rather than reliance on automated outputs. Taken together, these approaches indicate that technical writing competency is best developed through a progressive curriculum in which communication evolves alongside technical knowledge and professional judgement.

2.6 Specification Writing as the Capstone Competency

Among the various forms of architectural documentation, specification writing represents the highest level of technical writing competency because it integrates technical knowledge, professional judgement, contractual awareness, regulatory compliance, and communication within a single professional task. Specifications define materials, workmanship, performance standards, and quality requirements, making them legally enforceable components of construction documentation (O'Sullivan, 2013; NBS, 2025).

Preparing effective specifications requires architects to synthesise knowledge acquired throughout their education, including construction technology, materials, environmental

systems, regulations, and professional practice. Beyond grammatical accuracy, specification writing demands clarity, consistency, precision, and sound technical judgement. Poorly prepared specifications have been associated with construction disputes, project delays, increased costs, and defective workmanship (PMWeb, 2023; Long International, 2024).

The growing adoption of BIM further reinforces the importance of specification writing by integrating textual information within digital project environments, where documentation quality influences information management, coordination, and automated compliance checking (Nahri et al., 2025).

Given its integrative nature, specification writing is conceptualised in this study as a capstone competency representing the culmination of progressive technical writing development. This perspective provides the foundation for the Six-Layer Technical Writing Competency Framework proposed later in the paper.

2.7 Research Gaps

The review identifies several important gaps that continue to limit the advancement of technical writing scholarship in architectural education.

First, technical writing remains underexplored as a distinct area of architectural education research, with most studies focusing instead on design communication, employability, or general graduate competencies. Second, no widely accepted framework exists for evaluating architecture-specific technical writing competency, particularly in relation to specification writing and professional documentation. Third, empirical evidence from Africa and other Global South contexts remains limited, restricting understanding of how different educational environments influence competency development.

Research evaluating curriculum interventions is also scarce. Although writing-across-the-curriculum, portfolio assessment, authentic assessment, and studio-integrated writing have demonstrated effectiveness in other professional disciplines, their application within architecture has received limited empirical attention. Finally, little research has examined how BIM and generative AI should be integrated into technical writing education while maintaining professional standards, critical judgement, and academic integrity. These gaps justify the need for an architecture-specific conceptual framework capable of guiding curriculum development and future empirical investigation. Table 1 summarises the five themes synthesised from the literature, alongside their key findings and implications for architectural curriculum development.

Table 1: Summary of Thematic Findings from the Literature Review

Theme	Key Finding	Implication for Curriculum
Technical writing as a professional competency	Technical writing is a discipline-specific professional competency essential to architectural practice, yet it remains underemphasised relative to visual and design communication.	Technical writing should be recognised and taught as an explicit professional competency rather than assumed to develop implicitly through studio work.
Architectural documentation and writing genres	Architectural practice relies on diverse genres, including specifications, technical reports, site records, and BIM-embedded information, demonstrating that written communication is integral to practice rather than supplementary to drawings.	Curricula should expose students to the full range of professional documentation genres, not specification writing alone.
Curriculum and assessment challenges	Technical writing is largely treated as an implicit outcome of studio education rather than an explicit learning objective, and institutional constraints such as large class sizes and crowded curricula further limit iterative writing practice.	Structured, discipline-integrated writing instruction and assessment are needed rather than reliance on incidental development.
Pedagogical approaches in cognate disciplines	Engineering, medicine, and law embed writing progressively through authentic tasks, Writing Across the Curriculum and Writing in the Disciplines approaches, and continuous formative feedback.	Architectural education can adapt WAC/WID principles and studio-integrated authentic assessment rather than introducing stand-alone writing courses.
Digital technologies and generative AI	BIM and generative AI are reshaping documentation practice, creating opportunities for efficiency alongside challenges relating to originality, technical accuracy, and academic integrity.	Curricula should build responsible AI literacy and BIM-related documentation skills alongside conventional technical writing instruction.

3. MATERIALS AND METHODS

3.1 Research Design

This study employed a **critical integrative literature review** to examine technical writing competency in architectural education. An integrative review was selected because it accommodates diverse evidence sources, including empirical studies, conceptual literature, professional guidance, and policy documents, making it appropriate for a field where architecture-specific research remains limited.

To strengthen the analysis, evidence from architecture was synthesised alongside literature from engineering, medicine, and law. These disciplines were selected because they similarly require practitioners to communicate complex technical information through specialised documentation and have established approaches to professional writing instruction. Comparative analysis enabled the identification of transferable educational principles while recognising the distinctive characteristics of architectural education.

3.2 Literature Search Strategy

The review followed a structured search strategy to identify relevant literature published between **1983 and 2025**. Searches were conducted using Scopus, Web of Science, Google Scholar, ERIC, ScienceDirect, Taylor & Francis Online, SpringerLink, and JSTOR, supplemented by professional publications from recognised architectural and construction organisations. Search terms combined keywords such as *technical writing*, *architectural education*, *specification writing*, *professional communication*, *Building Information Modelling*, *writing across the curriculum*, and *writing in the disciplines* using Boolean operators.

3.3 Eligibility Criteria

Sources were included where they:

- addressed technical or professional writing within architecture or related disciplines;
- examined curriculum, pedagogy, assessment, or professional competency;
- discussed specification writing, BIM documentation, or professional communication;
- were peer-reviewed publications, professional guidance, or authoritative policy documents.

Studies unrelated to professional communication or lacking sufficient methodological quality were excluded.

3.4 Data Analysis

The selected literature was analysed using **thematic synthesis**. Findings were coded and organised into five themes:

- technical writing as a professional competency;
- architectural writing genres;
- curriculum and assessment challenges;
- pedagogical approaches in cognate disciplines;
- digital technologies and AI in technical writing.

The synthesis informed the development of the proposed **Six-Layer Technical Writing Competency Framework**.

3.5 Quality Considerations

Because this study adopted an integrative review design, formal critical appraisal tools were not applied uniformly across all sources, which included empirical studies, conceptual papers, policy documents, and professional guidance. Instead, source quality was assessed based on

credibility, relevance, and contribution to the review objectives. Greater emphasis was placed on peer-reviewed empirical research, while professional publications and policy documents were used primarily to contextualise architectural practice, construction documentation, and curriculum development.

3.6 Limitations

This review has several limitations. First, as an integrative review, it provides an interpretive synthesis rather than an exhaustive systematic review of the literature. Second, the limited availability of architecture-specific empirical studies required the inclusion of evidence from engineering, medicine, and law. Although these disciplines differ from architecture, they share comparable demands for specialised technical communication and offer transferable pedagogical insights. Finally, the scarcity of research from African and other Global South contexts limits contextual understanding, pointing to an important priority for future research.
The methodological approach described above provided the basis for synthesizing the reviewed literature into five thematic areas, presented and discussed in the following section.

4. RESULTS AND DISCUSSION

4.1 Technical Writing as a Professional Competency in Architecture

The evidence synthesised in this review confirms that technical writing is a discipline-specific professional competency fundamental to contemporary architectural practice. Rather than functioning as a supplementary communication skill, technical writing enables architects to communicate technical knowledge, professional judgement, and regulatory requirements through documents that influence design implementation, project coordination, contractual obligations, and construction quality. Consequently, effective architectural communication depends on the integration of technical expertise with clear and purposeful written expression.
Despite this professional expectation, architectural education continues to emphasise visual communication more strongly than written communication. While studio-based pedagogy has been highly effective in developing design capability, it has generally provided fewer structured opportunities for students to acquire the technical writing competencies required in professional practice. In contrast, engineering, medicine, and law increasingly recognise professional writing as an explicit learning outcome embedded throughout disciplinary curricula.
The review further demonstrates that the growing complexity of architectural practice has intensified the need for technical writing competency. Collaboration within multidisciplinary teams, digitally integrated project delivery, and increasingly sophisticated regulatory environments require graduates to communicate technical information accurately to diverse professional audiences. These developments indicate that technical writing has become an essential component of architectural competence.
Collectively, the findings suggest that the central challenge for architectural education is not whether technical writing should be included within the curriculum, but how it can be systematically developed across successive stages of learning. This conclusion provides the foundation for the curriculum strategies and conceptual framework proposed in this study.

4.2 Communicative Demands of Architectural Documentation

The review demonstrates that architectural communication extends beyond graphical representation to encompass a range of technical documents essential to project delivery, regulatory compliance, and contract administration. Specifications, technical reports, design narratives, site records, contractual documents, and BIM-based information each perform distinct but complementary functions in translating design intent into built form. Together, they illustrate that written communication is integral to professional architectural practice rather than secondary to visual representation.

Among these genres, specification writing represents the most demanding form of professional documentation because it integrates technical, legal, and contractual responsibilities within a single document. Effective specifications require architects to combine technical knowledge, regulatory awareness, professional judgement, and precise written communication to define enforceable requirements for materials, workmanship, and performance standards.

The increasing adoption of digital construction technologies has further reinforced the importance of technical writing. Contemporary BIM workflows depend on structured textual information to support interdisciplinary coordination, information management, and regulatory compliance. Consequently, the quality of written documentation now influences both professional communication and the effectiveness of digital project delivery.

These findings challenge the traditional separation of graphical and written communication within architectural education. Rather than treating technical writing as supplementary to design, curricula should recognise both as complementary competencies that collectively underpin professional practice.

Recognizing the breadth of architectural documentation also raises an important educational question: how have other professional disciplines developed comparable writing competencies, and what lessons can architectural education draw from their experience?

4.3 Lessons from Comparative Professional Education

One of the most significant findings of this review is that architecture is not unique in facing challenges related to professional writing. Engineering, medicine, and law have similarly recognised that technical expertise alone does not ensure effective professional communication. In response, these disciplines have progressively embedded technical writing within disciplinary learning, treating it as a core professional competency rather than a generic academic skill.

Despite differences in professional practice, the reviewed disciplines demonstrate several common educational principles. First, writing is developed progressively across the curriculum through authentic professional tasks rather than isolated communication courses. Second, assessment emphasises discipline-specific documentation that mirrors workplace practice. Third, repeated opportunities for feedback enable students to refine both technical understanding and written communication. Collectively, these approaches reinforce the view that professional writing develops most effectively when integrated with disciplinary knowledge and practice.

These principles correspond closely with the educational philosophy underpinning architectural studio teaching. The studio already promotes project-based learning, iterative design, and reflective critique, providing a strong pedagogical foundation for embedding technical writing within existing learning activities. Rather than introducing stand-alone writing courses, architectural programmes can strengthen professional communication by

extending established studio practices to include authentic documentation tasks, structured feedback, and explicit writing outcomes.

The comparative evidence therefore suggests that curriculum reform should build upon, rather than replace, the strengths of studio-based education. Adapting proven pedagogical principles from cognate disciplines offers a practical and evidence-informed strategy for strengthening technical writing competency within architectural education.

4.4 Curriculum Implications for Architectural Education

The findings of this review indicate that strengthening technical writing competency requires curriculum integration rather than the introduction of stand-alone writing courses. Because professional documentation draws upon knowledge developed across architectural subjects, technical writing should be embedded progressively throughout the curriculum, enabling students to develop communication alongside technical and design competence.

Integrating technical writing within existing courses offers significant educational benefits. Writing tasks linked to building technology, structures, environmental systems, materials, and professional practice enable students to apply technical knowledge through authentic documentation while reinforcing disciplinary understanding. This approach reflects professional practice, where technical reasoning and written communication are inseparable.

The architectural design studio provides an effective environment for developing these competencies. While studios already promote iterative learning, design critique, and problem-solving, assessment often prioritises graphical presentation over written documentation. Expanding studio assessment to include specifications, technical reports, design justifications, consultant correspondence, and BIM-related documentation would provide students with more authentic preparation for professional practice without altering the fundamental studio model.

The review also shows the importance of assessment in developing writing competency. Evidence from architecture and related disciplines indicates that professional writing improves through repeated practice, formative feedback, and authentic assessment rather than isolated, high-stakes assignments. Portfolio assessment, staged writing tasks, peer review, and workplace-based documentation exercises therefore offer effective strategies for supporting progressive competency development.

Finally, curriculum reform should reflect the changing technological context of architectural practice. As digital project delivery and AI-assisted workflows become increasingly common, technical writing instruction should incorporate BIM-enabled documentation, responsible AI use, and critical evaluation of AI-generated content. Preparing students to use these technologies ethically and effectively will strengthen both their communication skills and their professional judgement.

Collectively, these findings support a curriculum model in which technical writing is embedded across architectural education as a core professional competency, developing progressively through authentic learning, integrated assessment, and increasing levels of professional responsibility.

4.5 Artificial Intelligence and the Future of Technical Writing Instruction

The rapid development of generative artificial intelligence (AI) has transformed approaches to technical communication across professional disciplines and is beginning to reshape architectural education. AI-assisted tools can now support the preparation of specifications, technical reports, project summaries, and other forms of professional documentation, creating

new opportunities for improving writing efficiency while raising important questions about professional responsibility and educational practice.

Much of the current debate surrounding AI in higher education has focused on academic integrity and assessment. However, the evidence reviewed in this study suggests that a broader educational perspective is required. As AI becomes increasingly integrated into professional practice, graduates must learn to use these technologies while developing the critical judgement to evaluate, refine, and verify AI-generated content. Consequently, architectural education should prepare students to work responsibly with AI rather than simply discourage its use.

This requirement is particularly important in technical writing because professional documents carry legal, contractual, financial, and safety implications. Although AI can assist drafting and language refinement, responsibility for technical accuracy, regulatory compliance, and professional accountability remains with the architect. AI should therefore be regarded as a decision-support tool rather than a substitute for professional judgement.

The review also points to the educational potential of AI. When used appropriately, AI can facilitate brainstorming, document organisation, editing, and formative feedback, allowing students to devote greater attention to technical reasoning and critical evaluation. Integrating AI into technical writing instruction therefore offers opportunities to strengthen, rather than replace, professional communication skills.

These developments suggest that AI literacy should become an integral component of architectural education. Beyond conventional writing skills, future architects will require competencies in prompt design, critical evaluation of AI outputs, verification of technical information, ethical decision-making, and professional accountability. As routine drafting becomes increasingly automated, the distinctive value of the architect will lie in exercising the technical judgement and ethical responsibility necessary to ensure that professional documentation remains accurate, reliable, and fit for purpose.

4.6 A Six-Layer Technical Writing Competency Framework for Architectural Education

Drawing on the evidence synthesised in this review, this study proposes a **Six-Layer Technical Writing Competency Framework for Architectural Education** as a conceptual model for curriculum design, competency development, and future empirical research. The framework is founded on the premise that technical writing develops progressively through the integration of disciplinary knowledge, communication skills, and professional judgement rather than through isolated instruction in writing mechanics.

The framework is not presented as a validated assessment instrument but as a theoretically informed model derived from the convergence of evidence across architecture and related professional disciplines. It integrates principles from competency-based education, Writing Across the Curriculum (WAC), Writing in the Disciplines (WID), authentic assessment, and professional communication scholarship while reflecting the distinctive communicative demands of architectural practice.

Figure 1 illustrates the overall structure of the proposed framework, showing the progressive development of competencies from foundational technical knowledge to specification writing as the capstone skill.

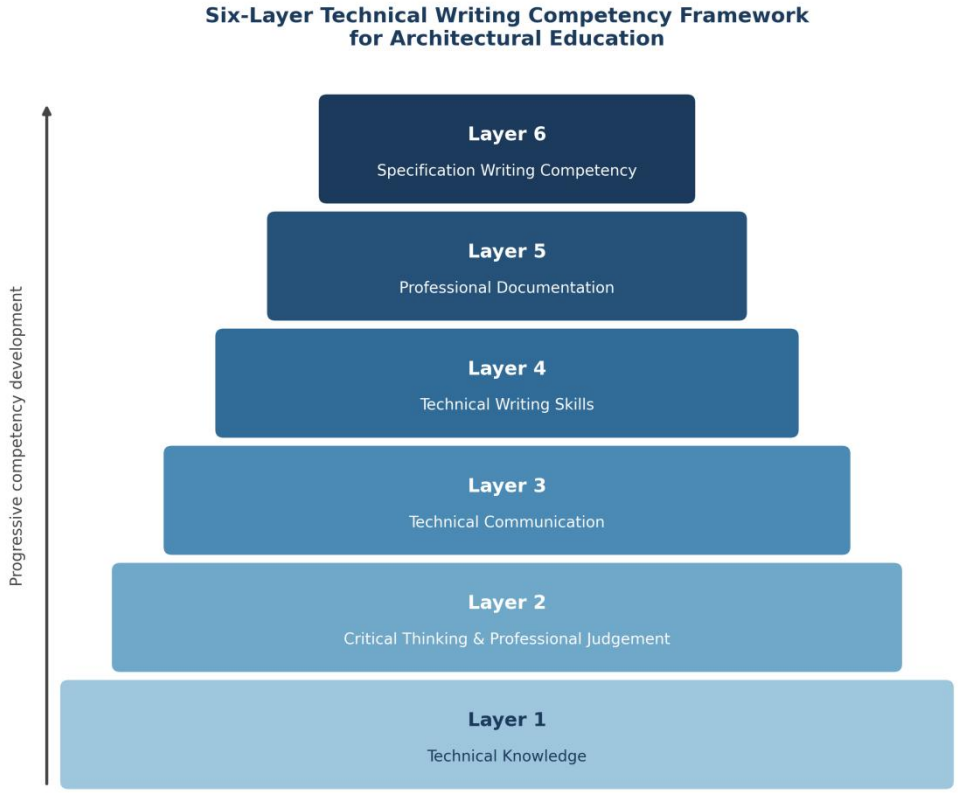

Figure 1: Six-Layer Technical Writing Competency Framework for Architectural Education
(Author's conceptual framework)

Layer 1: Technical Knowledge

Technical knowledge provides the foundation for professional writing. Students develop competence in building technology, structures, environmental systems, construction methods, materials, professional practice, and regulatory requirements. Because technical writing communicates disciplinary knowledge rather than replacing it, effective professional documentation depends upon accurate technical understanding.

Layer 2: Critical Thinking and Professional Judgement

Professional documentation requires more than technical knowledge. Architects must interpret information, evaluate alternatives, solve complex problems, and exercise professional judgement before communicating technical decisions. This layer emphasises analytical reasoning and decision-making as the basis for effective technical writing.

Layer 3: Technical Communication

At this stage, emphasis shifts from what students know to how effectively they communicate technical information. Students learn to explain complex ideas clearly to clients, consultants, contractors, regulatory authorities, and multidisciplinary teams, adapting communication to different professional audiences and contexts.

Layer 4: Technical Writing Skills

This layer develops the conventions governing professional documentation, including clarity, organisation, coherence, technical terminology, referencing, document structure, and genre awareness. Students learn to prepare technically accurate documents that satisfy recognised standards of professional communication while adapting their writing to different documentary purposes.

Layer 5: Professional Documentation

Building upon the preceding competencies, students develop proficiency in producing authentic architectural documentation, including design reports, feasibility studies, site reports, BIM documentation, consultant correspondence, contract administration records, and regulatory submissions. Instruction at this stage focuses on workplace authenticity, interdisciplinary collaboration, and professional expectations.

Layer 6: Specification Writing Competency

Specification writing represents the culmination of the framework because it requires the integration of technical knowledge, critical reasoning, communication, professional judgement, and writing skills within a single professional task. Effective specifications establish enforceable requirements for materials, workmanship, performance standards, and contractual obligations. Consequently, specification writing is conceptualised as the capstone competency through which students demonstrate readiness for professional architectural practice. Table 2 sets out the competency focus and typical learning activities associated with each layer of the framework.

Table 2: Competency Focus and Learning Activities Across the Six-Layer Framework

Layer	Competency Focus	Typical Learning Activities
Layer 1: Technical Knowledge	Building technology, structures, environmental systems, construction methods, materials, professional practice, and regulatory requirements.	Technical coursework and studio content that builds the disciplinary knowledge base underpinning professional documentation.
Layer 2: Critical Thinking and Professional Judgement	Interpreting information, evaluating alternatives, solving complex problems, and exercising professional judgement.	Analytical and decision-making tasks embedded within design and technical courses, prior to and alongside writing instruction.
Layer 3: Technical Communication	Explaining complex technical ideas clearly to clients, consultants, contractors, regulatory authorities, and multidisciplinary teams.	Audience-adapted communication exercises across varied professional contexts.
Layer 4: Technical Writing Skills	Clarity, organisation, coherence, technical terminology, referencing, document structure, and genre awareness.	Instruction in the conventions of professional documentation, applied across different documentary purposes.
Layer 5: Professional Documentation	Producing authentic architectural documentation, including design reports, feasibility studies, site reports, BIM documentation, consultant correspondence, contract administration records, and regulatory submissions.	Workplace-authentic documentation tasks emphasising interdisciplinary collaboration and professional expectations.
Layer 6: Specification Writing Competency	Integrating technical knowledge, critical reasoning, communication, professional judgement, and writing skills to establish enforceable requirements for materials, workmanship, performance standards, and contractual obligations.	Capstone specification-writing tasks demonstrating readiness for professional architectural practice.

The proposed framework is developmental rather than hierarchical. Although each layer builds upon preceding competencies, learning is expected to occur iteratively throughout architectural education, with increasing complexity and professional authenticity as students progress through the curriculum. The framework therefore supports curriculum mapping and progressive competency development rather than prescribing a sequence of stand-alone courses.

From a curriculum perspective, the framework provides educators with a conceptual basis for connecting learning outcomes, teaching activities, assessment strategies, and graduate competencies across architectural programmes. It also offers researchers a foundation for developing assessment instruments and evaluating curriculum interventions. Because the framework is derived from literature synthesis rather than empirical testing, future research should examine its reliability, educational effectiveness, and applicability across different architectural education contexts.

5. EDUCATIONAL AND PROFESSIONAL IMPLICATIONS

5.1 Implications for Curriculum Design

Technical writing should be recognised as a core graduate competency within architectural education and embedded progressively across undergraduate and postgraduate curricula rather than being confined to professional practice courses. Because professional documentation draws on knowledge developed throughout architectural training, writing instruction should be integrated across technical subjects and design studios to enable students to develop communication alongside disciplinary competence.

A curriculum-wide approach should incorporate discipline-specific writing tasks within building technology, structures, environmental systems, construction management, and design studios. Repeated opportunities for practice, formative feedback, and reflection would reinforce both technical understanding and professional communication while reflecting the principles of Writing Across the Curriculum and Writing in the Disciplines.

Specification writing should be introduced progressively throughout the programme. Students should first analyse existing specifications, then prepare individual specification sections before producing complete project specifications integrated with studio design work. This developmental approach is consistent with the competency framework proposed in this study and supports increasing levels of professional authenticity.

Assessment should similarly recognise technical writing as an explicit graduate outcome. Portfolio assessment, authentic documentation tasks, staged writing assignments, peer review, and structured formative feedback should complement conventional design assessment, enabling students to demonstrate competence in both visual and written communication.

5.2 Implications for Educators and Higher Education Institutions

Successful implementation of technical writing instruction requires institutional commitment as well as curriculum reform. Responsibility for developing writing competency should be shared across architectural programmes rather than assigned solely to communication or professional practice courses.

Faculty development initiatives should support lecturers in integrating writing activities within technical subjects and providing effective formative feedback. Shared assessment rubrics, programme-wide learning outcomes, and coordinated writing expectations would promote consistency while reducing duplication across courses.

Institutions should also strengthen students' exposure to authentic professional documentation by providing access to current building regulations, construction standards, technical

specifications, BIM platforms, and other digital documentation tools. Collaboration with professional practice can further strengthen learning by providing realistic documentation tasks and exposure to contemporary industry standards.

Given the increasing use of generative AI, institutions should establish policies that encourage responsible educational use rather than outright prohibition. Students should be guided to evaluate AI-generated content critically, verify technical accuracy, and exercise ethical and professional judgement when incorporating AI into professional documentation.

5.3 Implications for Professional Bodies and Accreditation Agencies

Professional accreditation standards play a central role in shaping architectural curricula and graduate competencies. Technical writing should therefore be recognised explicitly within accreditation frameworks alongside design capability, technical knowledge, and professional ethics.

Programme accreditation should consider evidence of students' competence in preparing professional documentation, including specifications, technical reports, contract administration records, and BIM-enabled documentation. Such recognition would encourage institutions to integrate technical writing more systematically while strengthening the connection between educational outcomes and professional practice.

Professional organisations can further support competency development by promoting best practice in specification writing, developing model documentation resources, expanding continuing professional development opportunities, and strengthening collaboration between academia and industry.

6 CONCLUSION

Technical writing is a fundamental professional competency that underpins architectural practice, yet it remains insufficiently embedded within architectural education. Although architects are expected to prepare specifications, technical reports, contract documentation, and BIM-enabled project information, these competencies are often assumed to develop implicitly through studio learning and professional experience rather than through deliberate curriculum design.

By synthesising evidence from architecture and cognate professional disciplines, this review demonstrates that technical writing is most effectively developed through progressive, discipline-integrated learning supported by authentic assessment, structured feedback, and professional writing tasks. These findings reinforce the need to reposition technical writing as a core component of architectural education rather than a peripheral communication skill.

The principal contribution of this study is the proposed Six-Layer Technical Writing Competency Framework, which provides a theoretically informed model for integrating technical writing across architectural curricula. By linking technical knowledge, critical thinking, communication, professional documentation, and specification writing within a developmental framework, the model offers a foundation for curriculum design, competency development, and future empirical investigation.

7. RECOMMENDATIONS

Although the framework requires empirical validation across diverse educational contexts, particularly within Africa and other underrepresented regions, it provides a basis for strengthening technical writing instruction in response to the increasing demands of digital practice, interdisciplinary collaboration, and AI-assisted professional workflows. Strengthening technical writing competency will better prepare architecture graduates to

communicate effectively, exercise sound professional judgement, and meet the technical, contractual, and collaborative responsibilities of contemporary architectural practice.

REFERENCES

Bittle, K., & El-Gayar, O. (2025). Generative AI and academic integrity in higher education: A systematic review and research agenda. *Information,* 16(4), Article 296. doi:10.3390/info16040296

Conspectus Inc. (2018). Construction document quality crisis. Retrieved from https://www.conspectusinc.com/blog/2018/04/construction-document-quality-crisis

Eng, K., Johnston, K., Cerda, I., Kadakia, K., Mosier-Mills, A., & Vanka, A. (2024). *Say what you'll write, write what you say: A patient-centered documentation skills curriculum in the era of patient-accessible notes*. MedEdPORTAL, 20, 11392. doi:10.15766/mep_2374-8265.11392

Kofinas, A. K., Tsay, C. H.-H., & Pike, D. (2025). The impact of generative AI on academic integrity of authentic assessments within a higher education context. *British Journal of Educational Technology,* 56(6), 2522–2549. doi:10.1111/bjet.13585

Long International. (2024). *Defective contract documents & their effect on claims.* Retrieved from https://www.long-intl.com/blog/defective-deficient-documents/

Maina, J. J. (2018). Professional competencies of architecture graduates: Perceptions from graduates, academics and employers in the Nigerian construction industry. *Built Environment Journal*, 15(2), 1–13.

Maina, J. J., & Salihu, M. M. (2016). An assessment of generic skills and competencies of architecture graduates in Nigeria. ATBU *Journal of Environmental Technology and Science* (AJETS), 9(1), 30–41.

McLeod, S. H., & Soven, M. (2000). *Writing across the curriculum: A guide to developing programs. Retrieved from WAC Clearinghouse* website: https://wacclearinghouse.org/docs/books/mcleod_soven/2000/mcleod_soven.pdf

Milke, M. W., Upton, C., Koorey, G. F., O'Sullivan, A. D., & Comer, K. (2013). *Improving the writing of engineering students through portfolios. Paper presented at the ASEE* Annual Conference & Exposition, Atlanta, GA. Retrieved from https://peer.asee.org/improving-the-writing-of-engineering-students-through-portfolios

Nahri, I., Pinquié, R., Véron, P., Bus, N., & Thorel, M. (2025). *Extracting structured requirements from unstructured building technical specifications for building information modeling.* Retrieved from arXiv website: https://arxiv.org/abs/2508.13833

NBS. (2025). B*est practice guide to specification writing*. Retrieved from https://www.thenbs.com/best-practice-guide-specification-writing

O'Sullivan, L. (2013). *Answers from a specs writer.* Retrieved from Liz O'Sullivan Architecture LLC website: http://www.lizosullivanarch.com

PMWeb. (2023). *Using technology to protect project owners from the consequences of the poorly written or managed construction project specifications.* Retrieved from https://www.pmweb.com

Russell, D. R. (1991). *Writing in the academic disciplines*, 1870–1990: *A curricular history. Carbondale,* IL: Southern Illinois University Press.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books.

Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco, CA: Jossey-Bass.