



A NEEDS-BASED JUSTIFICATION FOR VTTSS TECHNOLOGY: CURRICULUM ANALYSIS, TEXTBOOK EVALUATION, AND LEARNER EVIDENCE IN TEACHING ARCHITECTURE-RELATED TERMINOLOGY

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Abstract

Before a new instructional technology is introduced, its necessity should be established through actual evidence rather than assumption. This article presents the comprehensive needs analysis conducted prior to the introduction of a VTTSS-based methodology for teaching architecture-related terminology. The analysis combines five instruments: an examination of the currently effective curriculum, a comparative evaluation of two categories of textbook against six criteria, a student questionnaire, semi-structured interviews with subject-area architecture instructors, and document analysis of student writing and authentic professional texts. The findings show that architecture-related terminology in the current curriculum and textbooks is presented incidentally, without visual support, and with limited professional authenticity. These gaps directly justify the classification of terminology into six semantic fields, the frequency-based selection of a terminological minimum, and the specific pedagogical decisions embodied in the VTTSS methodology.

Keywords: *needs analysis, curriculum analysis, textbook evaluation, ESP, architectural terminology, frequency analysis, contrastive analysis.*

Introduction

A methodology is only as sound as the evidence on which it rests. Before any instructional model is designed, it is necessary to establish, rather than assume, where the existing system falls short and what learners actually need. This article presents the needs analysis that precedes and justifies a VTTSS-based methodology for teaching architecture-related terminology: an examination of what the current curriculum and textbooks actually deliver, set against what a structured, multi-instrument investigation of learners' and instructors' perspectives reveals they require.

The analysis addresses five questions. Does the currently effective curriculum treat architecture-related terminology as a systematic strand of instruction? Do the textbooks in use meet established criteria for ESP materials? How should the terminology itself be classified for pedagogical purposes? What do students and subject-area instructors report about their actual difficulties and priorities? And which terms, among the many that could be taught, should be prioritised on the basis of frequency in authentic professional use? The answers to these questions, presented below, do not merely describe a gap; they generate the specific design decisions, semantic classification, term selection, and error-focused activities, on which a subsequent teaching methodology can be built.

Literature Review

The analysis is grounded in the established methodology of needs analysis within English for Specific Purposes (ESP). Hutchinson and Waters (1987) establish that effective ESP instruction begins with an analysis of learners' target communicative situation rather than with a generic syllabus subsequently adapted for a professional audience, distinguishing target situation analysis, present situation analysis, and the gap analysis that connects them. Dudley-Evans and St John (1998) refine this framework by distinguishing the absolute characteristics of ESP, notably its grounding in authentic material, from variable characteristics that may legitimately differ according to learner age, setting, and institutional constraint. Basturkmen (2010) contributes a practical framework for translating needs-analysis findings into concrete syllabus units, informing the classification procedure adopted below.

A second body of literature concerns the evaluation of instructional materials. Cunningsworth (1995), together with the complementary frameworks of Sheldon (1988), McGrath (2002), and Littlejohn (2011) as consolidated in Tomlinson's edited volume on materials development (2011), establishes that a textbook must be judged not only for its linguistic content but for its relevance to learners' professional field, its use of authentic material, and the degree to which its tasks approximate real communicative situations, criteria adopted directly in the comparative evaluation reported below.

A third body of literature concerns vocabulary itself. Nation (2001) establishes that vocabulary instruction should prioritise items in proportion to their frequency and communicative usefulness, while Chung and Nation (2004) provide a principled method for distinguishing genuinely technical vocabulary, terms whose meaning is specific to a discipline, from general academic vocabulary that happens to co-occur with it. Both principles inform the frequency-based selection procedure reported in this article.

Research Instruments and Procedure

Five complementary instruments were combined in order to triangulate the evidence base, summarised in Table 1.

Table 1. Research instruments used in the needs analysis

Instrument	Purpose
Curriculum analysis	Establish whether the current syllabus treats terminology as a systematic outcome
Comparative textbook evaluation	Assess the textbooks in use against six established ESP criteria
Student questionnaire	Identify learners' self-perceived difficulties and preferred learning methods
Instructor interviews	Identify professional communicative priorities from the subject-area perspective
Document analysis	Catalogue recurrent terminological errors and establish frequency-based priorities

Curriculum Analysis

The currently effective syllabus for teaching English to architecture students was examined against six questions: whether architecture-related terms are identified as a distinct syllabus component; whether terminological competence is formulated as an expected learning outcome; whether thematic units are explicitly linked to architecture; whether students are trained to speak and write about drawings, materials, and planning; whether contact hours are proportionally allocated to professional content; and whether assessment evaluates terminological competence as a discrete outcome. Table 2 compares the syllabus content against the professional communicative needs identified through target situation analysis.

Table 2. Comparison of syllabus content with professional communicative needs

Professional need	Addressed in syllabus?	Comment
Describing structural elements	Partially	Vocabulary appears incidentally, without a dedicated unit
Reading and interpreting drawings	Minimally	No systematic work with plans, sections, or elevations
Discussing building materials	Partially	General vocabulary only; technical terms largely absent
Presenting a design project	Minimally	Presentation skills taught generically, not architecture-specific
Professional correspondence and reports	Not addressed	No dedicated genre-based instruction
Sustainable and urban-planning terminology	Not addressed	Absent from current thematic units

The syllabus includes general communicative objectives and topics of broad professional relevance, but the development of architecture-related terminological competence is not presented as a separate, systematic learning outcome; vocabulary appears sporadically within general units such as “My Future Profession” rather than as a dedicated strand with its own progression and assessment criteria. A further finding concerns sequencing: topics are arranged according to general-English grammatical progression rather than according to the logical structure of the discipline itself, from building components through materials to structural systems and design, a mismatch that further reduces the syllabus's capacity to build coherent, cumulative terminological competence.

Textbook Evaluation

The textbooks currently in use were evaluated against six criteria drawn from the materials-evaluation literature: authenticity of material, professional relevance, visual support, terminological density, task authenticity, and assessment alignment. Table 3 presents the results for two categories of material in current use.

Table 3. Comparative evaluation of textbooks against ESP evaluation criteria

Criterion	General English coursebook	Supplementary ESP materials
Authenticity of material	Low, mostly constructed dialogues	Moderate, some adapted professional texts
Professional relevance	Low	Moderate
Visual support (drawings, diagrams)	Very low	Low
Terminological density	Low	Moderate
Task authenticity	Low	Moderate
Assessment alignment with professional outcomes	Very low	Low

The materials in use are well suited to the development of general English competence, providing a coherent grammatical progression and a balanced set of receptive and productive activities. Examined specifically for architecture-related content, however, several limitations emerge: architecture-related terms occur infrequently and are not grouped into thematic blocks; visual material such as floor plans and elevations is scarce or absent; terms that do appear are rarely embedded in professionally authentic contexts; and there is no progression of terminological complexity across units. Students working exclusively with these materials are consequently not well prepared to describe a building, explain a construction detail, or deliver a project presentation in English.

Classification of Architecture-Related Terminology

In order to design a systematic methodology, the terminology students must acquire was first classified. Drawing on Nation's treatment of specialised lexis and Chung and Nation's discussion of technical vocabulary, the architecture-related lexicon was organised into six semantic fields, presented in Table 4.

Table 4. Semantic classification of architecture-related terminology

Semantic field	Representative terms
Structural elements	column, beam, foundation, wall, roof, arch, dome, truss, slab, lintel
Building materials	concrete, steel, timber, brick, glass, mortar, insulation, reinforcement
Drawing and documentation	floor plan, elevation, section, facade, blueprint, scale
Building types and functions	residential, commercial, institutional, mixed-use, high-rise, low-rise
Spatial and design concepts	layout, proportion, symmetry, circulation, zoning, orientation

Semantic field	Representative terms
Sustainability and urban planning	sustainable design, green building, urban sprawl, land use, renewable energy

This classification serves two purposes: it provides a principled basis for selecting the terminological minimum to be taught, ensuring all six fields are represented rather than leaving the selection to chance, and it supplies the organising structure around which classroom lessons and independent tasks can subsequently be built.

Learner and Instructor Evidence

A student questionnaire addressed four areas: self-assessed ability to name structural elements in English, experience reading technical drawings in English, confidence delivering an oral project presentation, and preferred methods of vocabulary learning. Table 5 summarises the general pattern of responses.

Table 5. Summary of needs-analysis findings from the student questionnaire

Area investigated	General finding
Naming structural elements	Low to moderate confidence; terms known passively but rarely produced accurately in speech
Reading technical drawings	Very low confidence; most students report no prior classroom practice in English
Oral project presentation	Moderate confidence with general English; low confidence with precise terminology
Preferred learning methods	Strong preference for visual and technology-supported materials over rote memorisation

These findings were cross-checked through semi-structured interviews with three subject-area architecture instructors. All three independently identified describing structural systems and reading technical drawings as the two most significant gaps in students' professional English preparation, directly corroborating the questionnaire data. One instructor observed: "When students present their projects, they can usually explain the general concept, but as soon as they need to talk about how the building actually stands up, the vocabulary breaks down and they fall back into Uzbek or Russian." A second instructor raised the importance of hedging and evaluative language in professional design discussion, phrases such as "this solution might not be structurally efficient", a dimension not directly captured by the student questionnaire. A third instructor noted that students frequently encounter English terminology passively through design-software interfaces but cannot reliably use it productively: "They recognise the words in the software menus, but they can't necessarily use them in a sentence or explain what they mean to someone else."

Error Patterns and Contrastive Analysis

Document analysis of student writing and classroom transcripts allowed a preliminary catalogue of recurrent errors to be compiled, summarised alongside a brief contrastive comparison of English, Uzbek, and Russian terminology in Table 6, since the learners addressed by this analysis are bilingual or trilingual speakers of all three languages.

Table 6. Common learner errors and contrastive relationships in architecture-related terminology

Pattern	Example	Likely source
Confusion of near-synonyms	using “wall” for any vertical structural element, including columns	Insufficient exposure to precise semantic distinctions
Literal translation of compounds	“carrying wall” instead of “load-bearing wall”	Direct translation from Uzbek or Russian
Incorrect collocation	“make a foundation” instead of “lay a foundation”	Absence of authentic collocational input
Confusion between drawing types	referring to any technical drawing as a “plan”	“Plan” used broadly in Uzbek/Russian for any drawing type
Register mismatch	conversational vocabulary in a formal project description	Lack of exposure to professional genres

These patterns matter pedagogically because they identify precisely which contrasts require explicit attention: the distinction between structurally similar but functionally different elements, the fixed-compound status of terms such as load-bearing wall, and the sharp difference between English drawing types that Uzbek and Russian usage tends to collapse into a single word.

Frequency-Based Selection of the Terminological Minimum

Following Nation's principle that vocabulary instruction should prioritise items in proportion to frequency and usefulness, a preliminary frequency analysis was carried out on a small corpus of authentic materials collected during the needs analysis, comprising sample student projects, professional portfolio texts, and introductory architectural textbooks in English. Table 7 presents the resulting ranked bands.

Table 7. Selected high-frequency architecture-related terms identified in the preliminary corpus analysis

Rank band	Representative terms
Very high frequency	wall, floor, roof, building, design, structure, plan, space
High frequency	column, beam, foundation, facade, material, elevation, section, layout
Moderate frequency	cantilever, lintel, insulation, cladding, zoning, sustainable, orientation
Lower frequency (specialised)	thermal mass, passive cooling, urban sprawl, reinforcement, dimension line

These bands provide a principled basis for sequencing instruction: very high- and high-frequency terms are prioritised early, while lower-frequency, more specialised terms are reserved for later, once learners have consolidated the core terminological minimum.

Discussion: From Needs Analysis to Methodology

Taken together, the five instruments converge on a single conclusion: architecture-related terminology is introduced into the curriculum and textbooks incidentally rather than systematically, without visual support, without progression by discipline logic, without productive assessment, and without connection to the professional genres, technical specification, project description, and design-review discourse, that will dominate students' subsequent professional communication. This is not a minor omission but a structural gap between what the system provides and what learners and instructors independently identify as necessary.

Each finding reported above translates directly into a design decision. The absence of systematic classification justifies organising instruction around the six semantic fields established in Table 4. The near-total absence of drawing-reading practice justifies dedicating focused instruction specifically to reading architectural drawings. The predominance of receptive-only textbook exercises justifies requiring productive, communicative use at every stage of instruction. The catalogued error patterns justify targeted, contrastive activities addressing precisely the confusions the analysis identified, near-synonyms, literal translation, and drawing-type confusion, before they become entrenched. The frequency bands justify a principled sequence of introduction, from core to specialised vocabulary, rather than an arbitrary one. In this way, the needs analysis reported here does not merely diagnose a problem; it supplies the specific evidentiary basis for every major design decision in the methodology it precedes.

Conclusion

A sound instructional methodology begins with evidence, not assumption. The needs analysis presented in this article, combining curriculum analysis, comparative textbook evaluation, a student questionnaire, instructor interviews, and document analysis, establishes that architecture-related terminology is currently taught without the systematicity, visual grounding, or professional authenticity that learners' future activity requires. These findings directly generate the semantic classification, the frequency-based terminological minimum, and the specific pedagogical priorities that a subsequent methodology must address, providing the empirical foundation on which its effectiveness can later be evaluated.

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