DEVELOPING IT STUDENTS' PROFESSIONAL COMMUNICATIVE COMPETENCE THROUGH CLIL

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Abstract

This conceptual article examines how content and language integrated learning can support professional communication among undergraduate students of Information Systems and Technologies. A focused narrative synthesis connects CLIL scholarship, a computing curriculum framework and language assessment principles. The analysis produces a proposed competence framework, a sequence of integrated classroom tasks and an assessment design that keeps technical understanding visible alongside English performance. Five components are distinguished: professional cognition, linguistic and terminological resources, discourse and pragmatic competence, strategic interaction, and reflective evaluation. A database design scenario illustrates how students can explain requirements, justify decisions and revise their communication using evidence. The central argument is that CLIL offers educational value when technical reasoning creates a genuine need for language and language support helps students express that reasoning. Merely inserting computing terminology into general English exercises does not establish this relationship. The proposed outcomes are methodological results rather than measured learning gains. The article identifies teacher collaboration, manageable content demands and separate reporting of content and language achievement as conditions for implementation and subsequent empirical investigation.

Keywords: CLIL; Information Systems and Technologies; professional communicative competence; technical reasoning; integrated assessment; English language teaching.

Introduction

An IT student may understand a technical solution yet struggle to explain its purpose to another person. This article addresses the instructional space between knowing how a system works and communicating that knowledge in English. Computing Curricula 2020 includes professional communication and teamwork within the preparation of computing graduates [1].

The educational problem is therefore more specific than insufficient vocabulary. A student explaining a database decision must identify the relevant requirement, select evidence, connect a cause with its consequence and adapt the explanation to the listener. English instruction can address these actions through technical problems that are already meaningful within the degree programme. The proposed setting is an undergraduate English course coordinated with introductory computing subjects; it is not an English-medium replacement for an entire IT curriculum.

CLIL provides a dual focus on disciplinary learning and language development [2]. For this article, integration means that students learn or deepen a defined computing concept while practising the English

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needed to reason about it. The technical outcome and the communicative outcome must both be stated in advance. A lesson on database keys, for example, should require students to explain how an identifier prevents ambiguous records, rather than simply translate the word “key”.

The CEFR Companion Volume broadens language performance to include mediation and interaction [3]. These categories help formulate outcomes for explaining a technical diagram to a peer or reconciling different interpretations of a client request. Their use here is an adaptation to IT education, not an assertion that the CEFR supplies a ready-made computing syllabus or validates a locally constructed competence scale.

The article asks three questions. Which components make professional communicative competence observable in an IT English classroom? How can integrated tasks connect those components with technical learning? What evidence can distinguish improvement in communication from improvement in content knowledge? The contribution is a practical conceptual framework with worked examples and an evaluation plan. It does not report an intervention, a student sample or statistically established advantages.

Literature Review

CLIL scholarship connects subject content with the language required to learn and communicate it. Coyle, Hood and Marsh provide a framework for planning this relationship [2]. The four dimensions commonly associated with CLIL are content, communication, cognition and culture. In the present proposal, these dimensions guide task design; they are not treated as four independent scores or as evidence that a task has already produced learning.

Dalton-Puffer’s review identifies a substantial language-oriented research tradition while noting difficulties in evaluating content outcomes [4]. This distinction matters for IT courses: a fluent explanation can contain an incorrect technical claim, while a technically sound answer may be expressed with limited grammatical control. The present framework consequently separates the evidence for technical accuracy from the evidence for communicative effectiveness before considering their relationship.

Bruton questions whether favourable CLIL comparisons adequately account for selection and other differences between learner groups [5]. That criticism sets an evidential boundary for this article. A proposed benefit is a plausible instructional mechanism, not proof of superiority over another approach. Any future comparison must consider starting proficiency, prior computing knowledge, teaching time and access to additional learning resources.

Ball, Kelly and Clegg foreground support for understanding input and producing output in CLIL instruction [6]. Applied here, support can include an annotated diagram, a short model explanation or a phrase bank for expressing conditions. The instructional decision is which obstacle each support addresses. A vocabulary list cannot repair a misconception about a database relationship, and an additional technical diagram may not help a learner formulate a polite clarification request.

Black and Wiliam situate formative assessment within a wider account of pedagogy and learning [7]. This article uses that perspective to make revision part of the proposed task sequence. Feedback has an instructional purpose when students use it to change an explanation, reconsider evidence or ask a better question. A mark attached to an unchanged final product offers less information about that process.

Task-based language teaching provides a complementary account of meaning-focused classroom activity [8]. CLIL remains the organising approach in this article because learning the technical content is an explicit objective. A task supplies the communicative problem through which that learning can become visible. This distinction prevents “CLIL” from functioning as a general label for any group activity involving a computer.

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The reviewed sources support a design problem rather than a settled local conclusion. A computing curriculum can identify valued professional practices; language frameworks can help describe communication; CLIL can connect both in instruction. None of these sources independently establishes the effectiveness of the particular sequence developed below. Its value must initially be judged by conceptual coherence, technical plausibility and the clarity of the evidence it asks students to produce.

Materials and Methods

The study uses a focused narrative synthesis followed by conceptual instructional design. The materials comprise the eight sources listed in the reference section: a computing curriculum report, a language framework, CLIL scholarship and publications on task-based teaching and formative assessment. Sources were purposively selected for their direct relevance to the design questions. Publisher, institutional and official resource pages were used to verify bibliographic information and accessible descriptions. This is not a systematic review, and no claim of exhaustive retrieval or pooled effect estimation is made.

The analytical unit is the relationship between a learning objective, a communicative action and observable evidence. The synthesis first identifies the broad constructs supplied by the sources. It then asks how each construct could operate within a familiar undergraduate IT problem. Finally, it examines whether the proposed evidence would allow a teacher to judge the intended outcome without confusing it with unrelated programming experience or general verbal confidence.

Three design rules govern the translation from theory to classroom procedure. First, every task must include a technical decision that matters to its outcome. Second, a learner must communicate the grounds for that decision to another person. Third, the assessment must retain separate information about technical understanding and English communication. These rules are author-developed operational choices, not externally validated measures.

The illustrative scenario concerns a small equipment-loan database. Students identify entities, explain identifiers and discuss the relationship between a borrower and a loan record. The scenario is selected because the reasoning can be represented through a diagram and a few sample records without requiring a large software implementation. All classroom events, sample utterances and proposed timings in this article are constructed examples. They do not describe observed students or collected data.

The intended instructional population is undergraduate IT students with sufficient introductory content knowledge to discuss simple information systems. Language support should be adjusted after a short diagnostic task rather than assigned solely from a presumed year-of-study level. An institution can adapt the framework to A2–B1 learners by reducing the amount of text and narrowing the decision, or to more advanced learners by introducing competing requirements. These adaptations are proposals requiring local piloting.

No human participants were recruited, no recordings were collected and no statistical procedures were applied. The results therefore consist of the competence framework, task architecture and assessment specifications derived through the analysis.

Results

A framework for professional communication

The first methodological result is a five-component description of professional communicative competence. Professional cognition concerns understanding a technical situation, identifying relevant information and connecting a proposed action with its consequences. Linguistic and terminological competence concerns the words and grammatical resources used to convey those relationships accurately. Discourse and pragmatic competence concerns organising an explanation for a particular purpose and

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audience. Strategic interaction concerns clarifying, repairing and negotiating meaning. Reflective evaluation concerns recognising weaknesses in one's own performance and making justified revisions.

These components are analytically distinct but function together. Consider a student who states that each borrower should have an identifier because names may be duplicated. The technical relationship belongs to professional cognition. Accurate use of "identifier" and "duplicate" belongs to terminology. Explaining the problem before presenting the solution concerns discourse. Asking whether the client wants to track individual loans concerns interaction. Revising an earlier diagram after discovering a missing relationship concerns reflection.

The framework also distinguishes a component from a performance level. A learner may use terminology accurately while requiring substantial support to organise an explanation. Assigning a single label such as "advanced communicator" would hide that difference. Teachers should initially report a profile across components and record the support conditions under which each performance occurred. A profile allows instruction to address a specific obstacle instead of repeating an entire lesson.

An observable objective should combine a situation, an action and a success condition. For example, after examining sample loan records, the student explains why a unique borrower identifier is necessary and supports the explanation with an example of ambiguous names. The objective does not prescribe a particular sentence or accent. It requires a defensible technical relationship expressed intelligibly enough for another student to act on it.

The proposed advantage of CLIL is the repeated connection between conceptual distinctions and communicative choices. Students need precise language because an imprecise explanation can change how the system is designed. The task gives a reason to distinguish a borrower from a loan and a record from an attribute. Such precision can remain hidden in a general discussion about the importance of technology. Nevertheless, this mechanism predicts an opportunity for learning; it does not quantify a gain or guarantee transfer to professional employment.

Connecting the four CLIL dimensions with evidence

The second result is an alignment matrix. It translates the four CLIL dimensions into the equipment-loan scenario. Culture is interpreted through audience expectations, respectful disagreement and responsibility toward system users. It does not require students to attribute fixed communication styles to national groups. The matrix is a proposed planning instrument, developed for this article.

CLIL dimension	Technical and communicative action	Evidence to collect
Content	Identify borrowers, equipment and loans	Annotated relationship diagram
Communication	Explain a design choice in English	Short explanation and response to a question
Cognition	Compare two ways of identifying borrowers	Reasoned choice using sample records
Culture	Consider users and negotiate disagreement respectfully	Revised requirement and meeting note

The matrix helps a teacher detect superficial integration. If students can complete the technical column without communicating, the interaction may be decorative. If they can complete the language

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activity without understanding the records, the content may be decorative. A well-aligned task makes the explanation necessary for a shared decision while keeping the technical challenge accessible.

For example, two groups receive different concerns. One considers duplicate names; the other considers a borrower returning more than one item. They exchange questions before agreeing on a diagram. The information difference gives students a reason to listen and request clarification. Their final diagram must be accompanied by a short decision note, allowing the teacher to compare what was agreed with the reasoning stated in English.

Technical accuracy remains bounded by the introductory syllabus. Students are not expected to produce a production-ready database or resolve every issue of data protection and system security. The teacher specifies which relationships are in scope and which require further specialist instruction. This boundary protects the language lesson from becoming an unmanageable software engineering assignment.

The same alignment can be reused with a network troubleshooting explanation, a simple interface review or a comparison of file organisation methods. Reuse should preserve the action–evidence relationship while changing the technical content. Merely replacing database vocabulary with networking vocabulary would not establish a meaningful transfer task.

A sequence for instruction and assessment

The third result is a five-stage sequence: diagnosis, supported understanding, simulated professional interaction, communicative product and reflection. Diagnosis begins with a brief individual explanation of a diagram. The teacher identifies whether the main obstacle lies in the concept, the English resources or the organisation of the answer. Supported understanding then addresses that obstacle through examples, visual representations or selected language patterns.

During simulated interaction, students take complementary roles such as analyst and client. The analyst asks questions about the loan procedure, while the client explains practical constraints. Roles are rotated so that a confident speaker does not permanently control the interaction. Students may consult a phrase bank, but the task requires responses to information that is not fully scripted. The resulting exchange should change or confirm the group’s technical decision.

The communicative product combines a diagram with a short English explanation. A useful prompt asks students to state the problem, describe the proposed relationship and explain why the design addresses the problem. A follow-up question tests whether they can adapt the explanation. Reading a prepared text aloud can show preparation, but it is insufficient evidence of responsive professional communication.

Assessment uses five criteria corresponding to the competence components. Each criterion can be rated from 1 to 5 with written descriptors. A score of 1 indicates that the relevant action remains largely unsuccessful despite support; 3 indicates a generally workable performance with gaps or prompts; 5 indicates accurate and appropriately independent performance under the stated task conditions. Scores 2 and 4 represent intermediate performance. These descriptors require calibration with actual student work before consequential use.

The teacher should retain both the score profile and a brief evidence note. A note such as “gave a correct reason for the identifier but could not clarify the loan relationship” is more useful than “needs better English”. Technical understanding should not be inferred from grammatical accuracy alone. Likewise, a functioning diagram should not automatically earn a high communication score if the learner cannot explain it.

Reflection asks the student to identify one substantive change between the first and revised explanations and to explain why the change improves communication. The evidence may be an added causal connector, a corrected technical distinction or a more precise question. Students should have

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another opportunity to perform the action after feedback. Without that opportunity, reflection risks becoming a written statement of intentions rather than evidence of learning.

Discussion

The proposed framework locates the advantages of CLIL in the organisation of learning opportunities. Technical content provides a purpose for communication, and communicative demands reveal whether students can make their reasoning accessible. The likely educational value lies in this relationship. A lesson becomes more professionally relevant when learners must explain the effect of a design choice on a user, rather than repeat an isolated definition. Relevance, however, should be investigated through student work and participation rather than assumed from the presence of computing terminology.

One expected benefit is diagnostic precision. A teacher can compare the learner’s diagram, spoken explanation and response to a question to identify different sources of difficulty. A second is the opportunity to transfer language across related technical situations. The causal structure used to justify an identifier may later support an explanation of why input validation is necessary. The teacher must explicitly vary the content and check whether students can reuse the communicative function without relying on a memorised text.

Integration also creates demands. If both the technical concept and the English text are unfamiliar, learners may struggle to determine what the task requires. A defensible response is to control one source of difficulty while retaining a meaningful decision. The teacher can supply a diagram and simplify the task instructions without removing the conceptual distinction students must explain. Excessive simplification, by contrast, can leave a vocabulary exercise with no substantive technical learning.

Collaboration between English and computing teachers is therefore a practical condition. The computing teacher checks conceptual accuracy and identifies likely misconceptions. The English teacher analyses the discourse functions and language barriers. Joint planning can begin with one shared task and two or three agreed criteria rather than an extensive new course. The aim is to establish a reliable connection between the subject timetable and the language lesson.

The model also requires a realistic account of multilingual learning. Students may use a familiar language briefly to clarify a difficult concept, provided that the target communicative product and interaction include meaningful English use. Teachers should record such support when interpreting independence. A total ban on familiar languages may suppress useful reasoning; unrestricted substitution may leave too little English practice. The balance should follow the objective of the particular stage.

Institutional feasibility depends on class size, available preparation time and access to appropriate materials. Printed diagrams and role cards can support the central sequence. Technology may help collect performances, but the proposed mechanism does not depend on a particular platform or continuous internet access.

Limitations and future evaluation

The framework is limited by its conceptual design and purposive source selection. It has not been validated with IT students, and its component structure should not be treated as a psychometrically established instrument. The illustrative database scenario covers only a small part of professional computing communication. Its suitability for other programmes depends on students’ subject knowledge, English proficiency and actual course requirements.

A future study should compare groups with equivalent instructional time and describe the comparison condition in sufficient detail. Baseline measures should include both English performance and the relevant computing concepts. Assessors should judge anonymised products where feasible, use

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shared descriptors and report agreement. Outcome tasks should include an unfamiliar but comparable technical situation so that improvement is not confused with rehearsal of the classroom example.

The strongest evaluation would combine several kinds of evidence. Individual performance can show whether students can explain a decision without help from a more proficient peer. Interaction records can show how clarification and repair occur. Revised products can show whether feedback changes reasoning or language. A delayed task can examine retention. Student perceptions can explain acceptability and workload, but they cannot by themselves establish improved professional competence.

Implementation records should also identify which supports were available and whether students used them. A higher score achieved with extensive prompts has a different interpretation from the same score achieved independently. Reporting both achievement and support conditions makes the evaluation more useful to teachers. Any eventual causal claim should remain proportionate to the design, sample and uncertainty of the study.

Conclusion

CLIL offers a coherent way to connect English learning with the technical reasoning expected of IT students. This article contributes a five-component competence framework, an alignment matrix and an instructional sequence that make the relationship observable. The proposed advantages concern purposeful language use, more precise diagnosis of learning difficulties and opportunities to transfer communicative functions across technical situations.

These advantages depend on clear content objectives, accessible materials, responsive language support and assessment that distinguishes technical knowledge from English performance. The framework can guide a small, locally evaluated teaching unit before wider adoption. Its present contribution is methodological: it specifies what students should do, what teachers should observe and what subsequent research must test. It does not establish that CLIL automatically outperforms other forms of English instruction.

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