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Conceptions of Pedagogical Content Knowledge: Insights from CLIL Teachers in an Iranian International School

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ABSTRACT

The rise of international education and Content and Language Integrated Learning (CLIL) has created new demands for teacher education and pedagogical content knowledge development. This exploratory qualitative study investigated teachers' conceptualizations of Pedagogical content knowledge in an English-medium, international, Content-and-Language Integrated Learning context, addressing instructional challenges, contextual influences on teaching practices, and the role of English proficiency in Pedagogical content knowledge development. Using a case-study approach, data were collected through classroom observations and in-depth interviews with eight participants selected via convenience sampling from an international school in Mashhad, Iran. The interview transcripts were analyzed using MAXQDA 12 and conducting open, axial, and selective coding procedures. Findings revealed six core PCK domains, with knowledge of technology, culture, context, and language emerging as critical additions to traditional pedagogical content knowledge frameworks. The study highlights how technological advancements necessitate digital competence; internationalization of education demands intercultural competence; and English-medium instruction requires linguistic awareness or advanced language proficiency in the context. The results underscore the evolving nature of pedagogical content knowledge in a Content-and-Language Integrated Learning environment, emphasizing the role of Englishization and multiculturalism in shaping pedagogy. This study may serve as an effort in teacher education, advocating for more investigations in search of a more comprehensive model of pedagogical content knowledge within the context of international education.

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1. Introduction

There are currently 14,833 active English-medium international schools worldwide, serving approximately 7.4 million students aged 3 to 18 (The International Schools Market, 2025, para. 2). These figures reflect a 45% increase in both schools and

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enrollments since 2005. As noted by Galloway et al. (2020), the appeal of English-medium instruction (EMI) and access to globally recognized examinations--as gateways to international higher education and career opportunities--are the key drives behind this rapid growth.

Two unique features set international schools apart from national ones: 1) curriculum model, which is designed primarily for expatriate students in a second language; 2) medium of instruction, which is typically English and delivered through Content-and-Language-Integrated Learning (CLIL). Harmer (2012) regards CLIL a dual-focused method that integrates second language instruction with academic content—that is, "the content is learned through and with the language, while the language is acquired through and with the content" (p. 226). Globally, the adoption of CLIL has increased significantly, accelerating the use of English as a medium of instruction—a trend Lanvers & Hultgren (2018) calls the 'Englishization of education'. This phenomenon, driven by globalization, continues to impact and reshape local educational practices and policies (Macaro et al., 2018). CLIL advocates believe that the approach is "helpful for fostering multilingualism, cultural awareness, deeper intercultural competence, critical thinking" (Brüning & Purrmann, 2014, p. 316).

To demonstrate pedagogical competence, teachers need to fulfill certain professional qualifications across a range of settings. Traditionally, the qualifications are defined in terms of a set of knowledge bases or expertise and seen as proof of teacher professionalization (See for instance Borko & Putnam, 1996; Grossman, 1990; Wilson et al., 1987). Lee Shulman (1987) is credited for laying the foundation for describing teacher expertise in terms of pedagogical knowledge (PK), content knowledge (CK), and pedagogical content knowledge (PCK); however, the post-Shulman era saw some critiques of his original framework. Hoping for a more comprehensive framework, Kind (2015) extended Shulman's foundational domains of triple knowledge bases by incorporating knowledge of assessment, , curriculum, and students into his version of teacher knowledge bases (p.192). Similarly, Carlsen (2002) proposed a PCK framework with five domains: "(a) general understanding of the context, (b) specific knowledge of context, (c) general pedagogic knowledge, (d) subject-matter knowledge, and (e) pedagogical content knowledge" (as cited in Gess-Newsome & Lederman, 2006, p. 135).

The PCK model most relevant to this study is Fernández's (2014) framework as it categorizes context into micro-level (classroom dynamics, student backgrounds) and macro-level (societal, national influences) dimensions (p. 86). In international schools—characterized by multicultural classrooms and linguistically diverse learners—PCK must be understood as context-dependent while little research has so far examined how teachers adapt PCK to such settings. Addressing the gap, this study investigates Iranian international schoolteachers' conceptualizations of PCK and the challenges they face in implementing it within a CLIL, multicultural, and context-dependent environment. The inclusion of context and recognition of elusive nature of PCK in Fernandez's (2014) model make it serviceable to explore PCK through the eyes of teachers in a second-language, international context of a school in Iran. The provision of specific and general pedagogic contexts makes the boundaries of the knowledge domains less blurry and investigations of PCK beyond national into international educational contexts more feasible. More succinctly, the international, multicultural context as well as EMI in an international school make such sites context-specific and hence the study of PCK context-dependent. To inspect PCK role in such a situation, a

study of teachers' challenges and conceptualizations is warranted since few studies have so far examined the functioning of PCK under this condition.

Given the distinct socio-cultural and linguistic demands of international school environments, this study examines international educators' perspectives through four guiding questions:

Research Question 1: How do teachers in an English-medium international CLIL setting conceptualize Pedagogical Content Knowledge (PCK)?

Research Question 2: What are the most salient instructional challenges that educators encounter in an international CLIL environment, and how do they navigate them?

Research Question 3: In what ways do teachers perceive the CLIL context as influencing their pedagogical approaches and decision-making?

Research Question 4: Does the English language proficiency of the teacher shape PCK development in such contexts?

2. Review of Literature

The concept of PCK has been a cornerstone in understanding teacher expertise since its introduction by Lee Shulman in the late 1980s. Shulman (1986, 1987) proposed a foundational model of teacher competence, distinguishing between essential knowledge types of subject matter, pedagogy, curriculum while emphasizing the critical integration of content and teaching strategies. This conceptualization was later expanded upon in the National Science Education Standards (National Research Council, 1996), which framed PCK as a dynamic interplay of content mastery, curricular knowledge, pedagogical strategies, and learner awareness. (Lee & Luft, 2008, p. 1345). Building on these works, the literature review first examines how PCK is theorized and enacted within educational contexts. It then justifies further studies of this construct, as the interplay between language and content teaching in international education sites introduces unique complexities.

3. Theoretical Framework

In response to critiques such as Tsui (2009) and Sleeter (2011), who criticized Shulman's PCK model for lack of specificity in practical development, assessment, and application, Shulman subsequently refined his framework. The revised model incorporated three content-related knowledge domains (subject-matter content, PCK, and curriculum knowledge) along with four traditional categories: general pedagogy, learners, their characteristics, educational contexts, and educational purposes (Gess-Newsome, 1999; Van Driel et al. 1998). Building upon Shulman's work, researchers further developed the model by incorporating social, affective, and contextual dimensions. To delineate PCK components, scholars have conceptualized it alternatively as either an integration of distinct knowledge bases or as a transformation of these components into a unique form of teacher expertise (Gess-Newsome, 1999; Park & Oliver, 2008). This line of research has identified nine key subcategories that constitute PCK, including 1) Knowledge of purpose and goal of teaching content; 2) understanding learners' perceptions, needs, learning styles and difficulties; 3) knowledge of curriculum, its core and peripheral objectives; 4) knowing the subject and teaching strategies for it; 5) knowledge of instructional media or technology for teaching; 6) knowing assessment methods for the subject; 7) deep knowledge of discipline-specific content; 8) awareness of the sociocultural contexts; and finally 9)

familiarity with teaching-learning methodologies (for details see Carlsen, 2002; Gess-Newsome & Lederman, 2006; Grossman, 1990; Hashweh, 2005; Kind, 2015; Loughran et al., 2001; Van Driel et al., 1998).

Despite variations in PCK conceptual models, researchers agree on several defining characteristics of the construct. The scholarly consensus in the literature indicates that PCK has the following key features:

- PCK is experiential and develops through practice as teachers refine their ability to address student needs (Van Driel et al., 1998; Hashweh, 2005).
- PCK, according to Cochran et al. (1993, p. 266), is shaped by "prior knowledge, cultural backgrounds, and the physical learning environment".
- Gess-Newsome (2015) believes that "PCK emerges from the interaction of multiple knowledge domains (content, pedagogy, context) and is influenced by teachers' beliefs, goals, and identity" (p. 35).
- PCK is inherently amorphous, and the feature makes its assessment and enactment complicated in practice (Loughran et al., 2004; Berry et al., 2016).
- Shulman (1987) regards PCK bi-componential, containing declarative (what is to teach) and procedural (how to teach) dimensions.

Scholarly investigations of PCK have evolved from foundational theoretical explorations to diverse empirical studies examining its manifestations in classroom practice. Researchers have sought to define, measure, and apply PCK across disciplines and educational contexts, resulting in a rich body of literature. These studies can be broadly organized around six principal research themes, reflecting key debates, methodological approaches, and practical implications for teacher development and student learning.

- **Beliefs and Misconceptions.** A study by Park and Oliver (2008) showed (science) teachers often confuse PCK with content knowledge; however, after watching videos of their own teaching, they realized PCK is about tailoring lessons to students' needs.
- **Expert-Novice Comparisons.** In a study of 24 teachers on the divergences in PCK between experienced and novice teachers, Loughran et al. (2004) reported that experts demonstrated more adaptive PCK by anticipating student misconceptions and using multiple explanations, while novices reacted only after errors emerged. Similarly, expert-novice differences extend to social studies, where it was found experts contextualized historical content thematically, while novices emphasized rote facts (Gudmundsdottir & Shulman, 1987).
- **Experience and Development**. Concerning the developmental nature of PCK, Van Driel et al. (1998) studied twelve teachers for two years and concluded that experienced teachers showed significantly richer PCK in predicting misconceptions and adapting analogies for students. In another study, Hashweh (2005) studied eighteen early-career and experienced teachers and found that experienced teachers developed reusable teaching strategies for tough topics, while novice teachers reinvented approaches lesson-by-lesson.
- **Disciplinary Perspectives.** Research has extensively documented variations in PCK across subject areas. The variations are evidenced by Kind and Chan, (2019) in science, by Grigaliūnienė et al., (2025) in mathematics, by Monte-

Sano & Budano (2013) in history/social studies, and by Bunch (2013) in language /literacy education.

- **Intervention Efficacy:** Research on the impact of training has shown that professional development interventions consistently shift participants' conceptions of teaching and learning (Van Driel et al., 1998). Furthermore, Alonzo and Kim (2016) recorded significant gains in science teachers' ability to anticipate misconceptions through video reflection, while meta-analysis by Huang and Shimizu (2022) showed lesson study is particularly effective for math teachers' conceptual adaptations.
- **Reliable Assessment of PCK**: Traditional assessment methods, such as classroom observations and stimulated recall interviews (Park & Oliver, 2008; Loughran et al., 2004), rely on trained observers to evaluate teachers' PCK during live instruction. However, these methods face limitations of time intensiveness, observer bias, and subjectivity. Recent assessment strategies—such as concept maps (Hashweh, 2005), lesson plan analysis (Rollnick et al., 2008), and paper-and-pencil tests (Kleickmann et al., 2012) prioritize scalability, and consistent interpretation across evaluators over rich contextual data of traditional PCK assessment strategies.

Reflecting on the earlier PCK conceptualizations, Shulman (2015) acknowledges that sociocultural dimensions and pedagogical contexts are not sufficiently accounted for in their formulations. In his retrospective critique, he contends that

> ... culture and context are huge envelopes within which we find many of the determinants of teaching and learning. PCK must be pedagogical content knowledge, pedagogical cultural knowledge, and pedagogical context knowledge. It is also about language, religion, and identity as features of the lived settings in which teaching, learning, and development occur. ... all teaching must be mindfully situated in the disciplinary, cultural, personal, and social settings in which it occurs. (Shulman, 2015, p. 10)

Building on the critical perspective, this study sought to examine teachers' beliefs about PCK by investigating the knowledge bases for teaching within a multicultural, international school context where English is the medium of instruction and students come from various national backgrounds. The research design incorporated cultural, contextual, and linguistic dimensions, drawing on Shulman's (2015) critique of his original model and later theoretical developments in the post-Shulman era. These theoretical foundations may support the conceptualization of PCK as an overarching and dynamic framework shaped by multiple interconnected knowledge domains and bases. The assumed variations in views within international schools may stem from contextual, sociocultural differences between national and international educational settings. The setting in an international educational context requires teachers to meet functional English proficiency standards and have what Freeman et al. (2015) term *"English-for-Teaching"* knowledge. Subject teachers in such environments must simultaneously fulfill dual roles of both experts in a discipline and instructors of a second-language, or mastery of two distinct knowledge domains for effective lesson delivery. Emphasizing contextualizing and situated learning, Richards (2008) argues that PCK transcends mere theory implementation and translating theories into practice.

He conceptualizes it as "constructing new knowledge and theory through engaging in particular types of activities and processes in specific social contexts" (Richards, 2008, p. 164). Building on Shulman's framework, Richards (1998) delineates L2 knowledge bases into six components 1) theoretical foundations of learning, 2) practical teaching competencies, 3) communicative and functional L2 proficiency, 4) subject-matter knowledge, 5) pedagogical reasoning and decision making skills, and 6) contextual understanding.

4. Methods

This study employed a qualitative case study approach to explore teachers' conceptualizations of PCK. Grounded in an interpretive, data-driven framework, the research integrated classroom observations and in-depth interviews to capture teachers' beliefs of knowledge types.

4-1. Research Design

Drawing on Schön's (1983) reflective practice model, the methodology involved two phases: 1) Classroom Observations to document teachers' reflection-in-action during instructional practice and analyze real-time decision-making; 2) Post-Observation Interviews to elicit teachers' reflection-on-action and probe their retrospective interpretations of PCK application. This dual-phase design enabled an examination of how teachers enacted PCK within authentic educational contexts.

4-2. Participants (or Sample)

The study involved eight secondary school teachers employed at the only accredited international school in Mashhad, Iran. They had a minimum of three years of full-time teaching experience and were selected through non-probability convenience sampling. Participation was voluntary, with informed consent obtained from all participants. The demographic profiles of the participants (age, gender distribution, academic qualifications, subject specializations, and years of teaching experience) are listed in Table 1.

Table 1.

Demographic data for the study sample and participants

Participant	Gender	Degree	Age	Subject specialization	Experience
Ali Reza	Male	Master's	33	Math.	7
Hamed	Male	Bachelor's	34	Physics	8
Mahla	Female	Master's	27	Math. & Geometry	**4**
Mansooreh	Female	Master's	35	Literature	8
Nadia	Female	Bachelor's	22	Art	3
Rihaneh	Female	Master's	31	Social sciences	5
Sara	Female	Master's	34	Computer	4
Zeinab	Female	Master's	36	Biology	4

4-3. Data Collection Instruments

Over a five-month period, data was collected and triangulated from three key sources to ensure methodological rigor: (1) classroom observations, (2) semi-structured interviews, and (3) teachers' monthly progress reports. Classroom observations allowed the

researcher to document real-time instructional practices within authentic teaching contexts, provided insights into how participants applied their PCK in situation, and guided the development of subsequent interview protocols for probing more deeply into emerging themes. Semi-structured interviews then complemented observational data by eliciting teachers' reflective perspectives, and monthly progress reports offered evidence of instructional adaptations over time**.**

4-4. Data Collection Procedure

The study utilized pre-installed classroom video recording systems to capture instructional sessions, enabling the researcher to cross-reference teachers' practices before and during interviews. Semi-structured interviews, conducted in either Farsi or English based on participant preference, lasted 10–15 minutes per session. The interview protocols were deliberately aligned with the study's objectives and informed by prior classroom observations to ensure thematic relevance. To strengthen data validity, monthly progress reports were analyzed to triangulate findings from interviews and observations. These reports served two key purposes: (1) verifying the consistency of emergent codes across datasets, and (2) identifying potential discrepancies that could suggest follow-up clarification with participants when necessary.

4-5. Data Analysis

For data analysis, interview transcripts were imported into MAXQDA 12, a software for qualitative data management and analysis. The dataset underwent a three-phase coding process of open, axial, and selective coding to identify patterns and relationships. This analytical approach revealed six distinct PCK domains, each comprising multiple thematic categories. As elaborated in the Results section, these findings underscore the complex and multi-dimensional nature of PCK within international school settings, highlighting its contextual adaptability and nuanced application.

5. Results

Through systematic analysis of the coded data, six core knowledge domains emerged as predominant themes in teachers' conceptualizations of PCK. While participants acknowledged these domains as theoretically distinct, they emphasized their interconnected and complementary nature in practice-- a perspective aligned with Lee and Luft's (2008) observations. Notably, the teachers categorized the knowledge domains into two types.

1. *General Pedagogical Knowledge (GPK)*, which is universal across all teaching contexts and includes the following as its core domains or components:

   a. Content Knowledge (subject matter expertise, curriculum standards);
   b. Pedagogical Knowledge (teaching strategies, classroom management, assessment design);
   c. Technological Knowledge (digital tools integration, multimedia resources).

2. Specific Pedagogical Knowledge (SPK), which is unique to international school contexts and has the following core domains or components

   a. Contextual Knowledge (International curricula of IB (International Baccalaureate), Cambridge IGCSE (International General Certificate of Secondary Education), etc., diverse student backgrounds.

b. Cultural Knowledge (intercultural competence, small 'c' culture dealing with the norms and values).
c. Language Knowledge (English language proficiency, content and language integration or CLIL).

This classification reflects participants' contextualized understanding of PCK as a dynamic construct shaped by and evaluated through these interrelated knowledge types. The following sections present each domain in detail, supported by direct participant commentary to illustrate their practical manifestations in international classrooms.

5.1. Knowledge of content (know-what) is quite essential but insufficient.

The Participants acknowledged content knowledge as essential for effective teaching but emphasized its limitations as a standalone part of PCK in English-medium international classrooms. They believed presentations through a second language make instruction more challenging, more difficult, but real-life at the same time. In addition to content and topical knowledge, they thought, teachers need to brush up their instructional knowledge by consulting supplementary materials to have more collaborative, group-based tasks than lecture presentations per se. One teacher puts the idea this way:

> Once, I was told of content-based instruction and its ... challenges. I had then a kind of vague idea of the method, but now I really find myself in the picture, within that context. I can have a more realistic grasp of how it feels like to teach science in English. … you have to think in English to communicate, to teach, to make the point clear. it requires a sort of high command of the subject and the language, of course. It's a double burden for me. Lack of the teacher's guide surely makes it difficult to be fully conscious of the topics ….

When asked to rank order the knowledge types, they ranked content knowledge first (sometimes second), concerning its contributions to effective teaching. Making a distinction between disciplinary content knowledge and PCK, the teachers mostly maintained that having a full command over the content provides no guarantee for successful teaching, making references to other types of knowledge and skills. Moreover, they mentioned the need for more time and teaching practices to gain more teaching experience and develop professionally. The evolving nature of PCK and its synchronous development with teaching experience, as implicitly stated by the respondents, have been reported in a number of studies as well (see for example, Friedrichsen et al., 2009; Lee & Luft, 2008).

5.2. Pedagogical knowledge (know-how) manifests itself as teaching strategies.

Pedagogical knowledge, described by the participants as the know-how of pedagogy, appeared as a critical component of PCK. This domain encompasses instructional strategies, lesson design, classroom management, and assessment practices in the context. They urged that there should be special training and orientation for knowing the curriculum structure, the pedagogical idiosyncrasies of general and specific context, the theories of learning, and their implications for application in their classroom. Another teacher's comment expresses this perspective:

> Knowledge of pedagogy plays a great role. ... As a teacher at this school, I should be then more skillful and knowledgeable than a national schoolteacher, because the students, the syllabus, and the overall context in here are all different, are more complex. ... I think the routine teaching methods may not... emm... work well here. One good way for me is to have workshops on IB, the Cambridge IGCSE, to attend webinars, and have online communities of teachers for sharing views on tricky topics.

Based on their perspectives, we may infer that they identified two pillars of effective pedagogy in the context: 1) adaptive teaching capability to flexibly adjust their instructional strategies to meet the needs of learners and address diverse cultural backgrounds in their classrooms, and 2) targeted professional development through pedagogical training and teacher collaboration networks.

5.3. Pedagogical technology knowledge helps to keep abreast of context-responsive innovations.

The need for technological literacy was inescapable for all teachers. Regardless of the context, they took knowledge of educational technology as a core PCK component and a precondition for quality education. This perspective is advocated by Mishra and Koehler (2006) in the literature when they viewed knowledge of standard technologies (books, chalk/whiteboards), and advanced technologies (Smart Platforms, LMS) as influential, but independent from knowledge of pedagogy and content. Some teachers echoed the need for the school to be equipped with more advanced technologies to qualify its name as an international school. The knowledge type was believed to be instrumental in treating individual differences in learning. One teacher commented that

> Technology knowledge is really important today. We need to know it and keep it updated because it can influence my presentations, and yeah, I need to know both the content ... and the technology for the topic and content. Some students here come from abroad and expect us to use technology. Sometimes, I find some students more skillful than myself with such tools, and apps, you know. So, I can't ignore it. I can make my practices more understandable, more motivating by using the appropriate software. Students expect me to be up to date in teaching techniques, not traditional, and ... technology helps me to change things and context for better learning.

Regarding teacher's knowledge of technology important, Mishra and Koehler (2006) introduce three interconnected knowledge domains for technology integration in education: 1)Technological Content Knowledge (TCK), 2) Technological Pedagogical Knowledge (TPK), and 3) Technological Pedagogical Content Knowledge (TPCK). By TCK, they mean understanding how technology and content influence each other, and which technology best represents and deliver specific content. The authors define TPK as teachers' knowledge of available technological tools and their ability to synchronize these tools with pedagogical strategies to enhance instruction. Building on this, Mishra and Koehler's (2006) TPCK concept extends beyond simply knowing content, pedagogy, and technology in isolation. It represents how teachers proficiently combine these knowledge domains in practice-applying educational technologies, implementing

pedagogical strategies, and demonstrating mastery of their subject's unique teaching requirements.

5.4. PCK serves as a mediating factor that influences and directs instructional approaches and learning processes

Concerning the context, teacher participants articulated how contextual knowledge directly shapes instructional approaches through comparative analysis of national versus international school environments. They talked about some facilitative contextual factors such as 1) optimal class sizes for easing differentiated instruction, 2) student-centered institutional cultures, 3) multilingual learning environments for fostering authentic language use, and 4) flexible curricular structures for supporting pedagogical innovation. Despite these facilities, participants highlighted some challenges as well as contextual constraints such as heterogeneous student language proficiencies which demanded adaptive scaffolding, limitations of technological infrastructure, and cultural-linguistic tensions in curriculum implementation.

They sometimes viewed the culture and context as interdependent and conceptualized context and culture as interrelated PCK components. They argued for an integrated perspective through descriptions of contextually grounded decision-making and accounts of adapting assessments for multicultural learners. Here is what a teacher participant says:

> The context here is different and knowing this can influence what and how to teach. The students come from different schools abroad, have studied different textbooks, and instructed differently, and have their own learning preferences and conceptions. This background is necessary for success. It's a real challenge for the teacher. In a national school, you don't find such gaps. The school, the classroom, the management, the syllabus, they are related and influence our teaching.

During reflections on curriculum design, one teacher emphasized the need to examine how curricular structure interacts with teaching contexts, specifically calling for analysis of its organizational framework, horizontal (grade-level) and vertical (progressive) coherence, and alignment with instructional objectives.

> ..., we should know about their present and previous curriculums while we have little knowledge about the things, the topics they are to study this year and the coming year sometimes. This has been my biggest challenge; I mean to know exactly the curriculum developer's purpose and the way the subjects and topics are structured and sequenced. We need orientation into the materials and resources.

Concerning educational context, Shulman (1987) conceptualizes it as a multifaceted and comprehensive knowledge base that encompasses "workings of the group or classroom, administering school or district, and broader sociocultural influences" (p. 8). This framework captures teaching context from immediate interactions in classrooms to wider community and broader societal and cultural influences.

5.5. Second language knowledge is a context-specific component and a necessary evil.

To most interviewees proficiency in English served as a double-edged sword in CLIL settings, regarding it as essential for content delivery and challenging for instruction at the same time. In other words, they viewed ESL proficiency as necessary for instruction but problematic for effective communication due to their perceived linguistic gaps. They divided over the type of proficiency required of them in such contexts: Basic Interpersonal Communication Skills (BICS) or Cognitive Academic Language Proficiency (CALP), to use Cummins' (1979) terminologies for the conversational language for daily routine communication versus the academic language to understand and discuss content in the classroom respectively. To provide an example, one teacher argued that

> Knowledge of the English language is perhaps the greatest challenge. We need to be proficient in conversational English first to communicate and teach through interactive activities. If not, we have to teach the book, not the concepts, not the content really. The academic language will be learned and practiced afterward if necessary. So, a teacher with a high proficiency level can be more successful than a teacher who gets a good score on GRE.

The pro-CALP participants believed the priority goes with academic proficiency. One teacher puts his argument this way:

> I think content knowledge is important while it is also formal and academic. So, you don't need to be conversationally fluent like native speakers. As far as your language medium is understandable, that's enough. The textbooks are full of technical words, and I should know them all, too. If you are to hire teachers, it is advisable to ask for a passing score on a GRE test in addition to high achievement on a general proficiency test like IELTS.

5.6. Pedagogical culture knowledge emerges as the third most significant factor shaping teacher practice in the school setting.

Pedagogical culture knowledge was viewed as a context-specific component and a pedagogical necessity in such a school environment. Some teachers regarded culture as a subcomponent of the context, not necessarily an independent domain of teacher knowledge. They had a capital C view of culture, which regards a general knowledge of literature and the arts as necessary. To most teachers, knowledge of culture (in its small c culture sense) as a conspicuous characteristic of an international educational site is a determining factor in teaching, learning, and PCK development. On one hand, they stressed the necessity to be aware of cultural diversity and develop what Byram (1997) terms "intercultural communicative competence" for creating constructive learning environments on the other. In other words, the data suggests that in international schools, effective PCK development requires treating culture as a daily pedagogical resource rather than background context, a bidirectional teacher-student learning process, and a scaffold for content delivery rather than a separate subject.

> .... cultural differences…. are easily accepted. I mean, the students cope with such differences among themselves soon. But ... I should be ready for

misunderstandings. They can be seen in the students' expectations of the teacher's role in class, ways of teaching, managing classes, types and amount of homework. I remember once I assigned an online search as homework. The next day, some parents called and asked for the assignments to be done in school, not at home. Or I can mention the issue of politeness, to what extent behaviors are to be interpreted as (im)polite. Sometimes, students think I'm too polite and perhaps lenient.

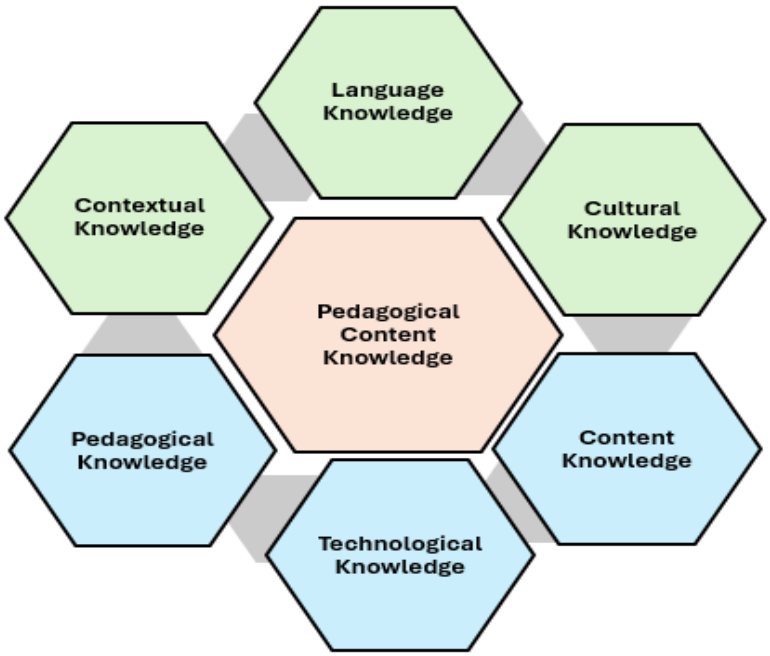
6. Discussion

The goal of this study was to examine PCK from the perspective of teachers in an international school context, where CLIL was the teaching approach. The findings revealed that while content knowledge (know-what) is essential, it must be complemented by pedagogical knowledge (know-how), which shapes teaching practices and strategies. Pedagogical technology knowledge further enhances adaptability to innovations, while PCK mediates instructional approaches and learning processes. In multilingual contexts, second language knowledge acts as a necessary but challenging component. Additionally, pedagogical culture knowledge (small c culture) significantly influences practice in international schools, highlighting the need for cultural responsiveness. Together, these themes underscore the multifaceted expertise required for effective teaching in diverse settings. So, at least four points meriting further discussions emerged as the results were analyzed.

First, inspecting PCK in the study context provided the chance to confirm the multifaceted and complex nature of the construct under study, a point reported and confirmed in some earlier studies (Kind, 2009; Loughran, 2012; Van Driel et al., 1998). The study revealed other embedded facets of PCK as well. The new aspect of this complexity moved away from Shulman's earlier model and showed the need to incorporate *knowledge of technology*, *knowledge of culture*, *knowledge of context*, and *knowledge of language* as additional pedagogical bases for teachers in an international, multicultural, EMI school context. While knowledge of educational technologies is a response to technological breakthroughs and the need to be technologically updated in all teaching-learning contexts, the knowledge of culture, contexts, and language are the other domains required of teachers in an international teaching context. The knowledge of language and culture are in fact the responses to the Internationalization and Englishization of education (Freeman et al., 2015; Lanvers & Hultgren (2018); Macaro et al., 2018; Spring, 2015).

The hypothetical relations and contributions of the knowledge bases to PCK are schematically depicted in Figure 1. The model corresponds with and relies on a constructivist-interactionist perspective of teaching-learning and shares some of its features with the model proposed by Cochran et al. (1993). The model classifies the knowledge bases into two kinds of generic and context-specific types. While the generic type comprises of knowledge types of technology, content, and pedagogy, the context-specific type consists of knowledge of contexts, culture, and language. Furthermore, it seems reasonable to consider the generic type more representative of teacher knowledge in national education systems and the context-specific type more exclusive to international contexts. More specifically, the framework takes PCK as an umbrella construct whose development and realization is determined and affected by at least six areas of knowledge and skills.

Figure 1.
A Hypothetical Model of Teacher Knowledge Bases and Expertise



Note. The figure illustrates knowledge bases in international school context.

Second, the results indicated that despite the complex and elusive nature of PCK (Fernandez, 2014), the provision of studying the construct within the sociocultural pedagogic context can increase the chance to articulate the knowledge bases and come up with a contextualized conception of PCK. Teachers could identify and implement the knowledge categories more readily in the specified environmental context. Concerning the integrative and transformative models of PCK (Gess-Newsome, 1999), the teachers adopted a more integrative position since, unlike a transformative model, they did not conceptualize PCK as a separate, and independent knowledge type; rather, they regarded teacher knowledge as a whole embracing all the six types of knowledge: 1)linguistic, 2)cultural, 3)pedagogical, 4)contextual, 5)content, 6)technological.

Third, the issue of language knowledge raised the question of the relationship between command of English and teaching competence, the impact of ESL/EFL proficiency on teaching (Elder, 2001; Richards, 2017). The basic question is what type of proficiency is required for effective teaching in such a context: a general English proficiency, or a domain-specific, academic English proficiency, or both. The type of proficiency for the learners is elaborated and dichotomized under the rubrics of BICS, (conversational proficiency) and CALP (academic proficiency) by Jim Cummins (1979, 2000). The need for rethinking teacher proficiency in the classroom has also been suggested more recently as Freeman et al. (2015) propose English-for-Teaching as the basic proficiency type and skills to conduct and present the lessons in a curriculum in a comprehensible manner to the students in English. The same authors further state that a teacher with general English proficiency is deprived of the specific language skills to accomplish the curricular objectives within the classroom context. The results of this study showed such a dichotomy of views about what types of proficiency a teacher is supposed to have for effective teaching within an international context. The role and issue of second language knowledge obviously needs further investigations.

Finally, the teachers assigned ranks of varying importance to the emerged knowledge categories; however, they mostly believed content knowledge played the greatest role and contributions to PCK development in line with the findings in previous research (Clermont et al., 1994; Friedrichsen et al., 2009; Gess-Newsome & Lederman, 2006). Language knowledge (English language proficiency) occupied the second rank in importance and a quite influential factor in the research context of international EMI and CLIL education.

7. Conclusion

The study offers some implications and insights for ESL educators, teacher-education programs, and educational leaders in international school settings. The findings highlight that Task-Based Instruction (TBI) not only enhances student engagement but also foster professional fulfillment among teachers by facilitating meaningful, communicative language exchanges. The demonstrated success of the interactive, information-exchange, and task-based activities underscores the need for teachers to move beyond traditional rote-learning methods toward more dynamic pedagogical approaches, design genuine classroom activities to bridge the gap between academic learning and practical application, build on the multicultural, multilingual dynamics of international schools to create socially interactive learning experiences.

For teacher education programs, the findings recommend curriculum enhancements through: (1) context-responsive pedagogical and training modules tailored to different and varied classroom settings, (2) intercultural competence development through equipping teachers with strategies to navigate and benefit cultural diversity, (3) technology-integrated language teaching strategies to support collaborative and autonomous learning, and (4) ongoing language proficiency support for content-area teachers to help them scaffold language development within their subject area they teach. Furthermore, the proposed model from this study may serve as a framework for identifying, recruitment and assessment of more capable teachers applying to teach in a CLIL international context.

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Conflict of Interest

The author would also like to declare that there is no conflict of interest regarding the publication of this paper.

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