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# Getting to the CoRe of Collaborative Online International Learning (COIL)

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In response to the COVID-19 pandemic in 2020, there was a worldwide pivot of education to online communication and the utilization of diverse digital technologies to enhance global learning and foster cultural understanding. Within higher education, educators faced unprecedented challenges in the conversion of face-to-face interactions into online, virtual classrooms, with many educators unprepared and untrained to do so. Yet, the introduction of online digital technologies for pedagogical interactions expanded the internationalization of previously limited curriculum prospects, to create global interconnectedness with the potential to invoke Students' awareness and appreciation of cultural differences in communication, leadership, and conflict. The development of international knowledge, pedagogical knowledge, and the linkage between the two is key for the internationalization of the curriculum. With the growth of new digital communication, learning opportunities such as Collaborative Online International Learning (COIL), aims to foster the development of intercultural competencies (ICC) in our students for future career advancement in an expanding global community. Despite the acknowledgment that faculty are underprepared and lack pedagogical knowledge to translate their lived experiences into their curriculum, there remains a tenable lack of available tools for educators to facilitate students actively participating in objective, equitable and inclusive intercultural communication. Herein, is proposed the novel application of a conceptual tool, a "content representation" or CoRe matrix, which explicitly separates a particular topic into divergent, yet linked dimensions of the knowledge and skills attributed to its content, teaching, and learning. It was hypothesized the CoRe tool could be applied to enhance an educator's PCK of ICC, providing the valuable link between international and pedagogical knowledge, for effective internationalization of the curriculum. The novel ICC CoRe matrix successfully addressed the 4 dimensions of ICC demonstrating the robust nature of the application of the CoRe matrix in the development of an educator's ICC PCK in the COIL classroom. With the exponential increase in digital technologies creating dynamic worldwide networks in education and the workplace, the development of conceptual tools such as the ICC CoRe matrix has the potential to develop and integrate an educator's pedagogical

knowledge with ICC, to support the development of effective, objective and inclusive student participation in global twenty-first-century classrooms and beyond.

KEYWORDS

COIL, CoRe, PCK, digital technology, intercultural, multicultural, online, learning

## Introduction

Throughout recent literature, there are strong arguments to increase internationalization of curriculum in higher education (Leask, 2013, 2015). Internationalization aims to create global interconnectedness by invoking Students' awareness and appreciation of cultural differences in communication, leadership and conflict, providing the valuable link between their specific content knowledge with its greater implications in the worldwide marketplace. The curriculum plays a critical role in the success or failure of the oft touted expanding internationalization portfolio of universities, integrating broader institutional strategies with the student experience. Faculty development of international knowledge, pedagogical knowledge, and the linkage between the two is key for internationalization of the curriculum. Confoundingly, faculty and its educators who have international experience do not always have the skills and pedagogical knowledge to translate their lived experiences into their curriculum or the skills to prepare students for objective, equitable, and inclusive intercultural communication. Moreover, despite the continuous debate, the role and power of curriculum internationalization remain under-appreciated in our rapidly expanding global society. With the exponential increase in digital technologies creating dynamic worldwide networks in education and the workplace, there is a critical need to integrate global concepts into teaching, yet limited research exists in the cognitive and conceptual preparation of educators to do so. The development of conceptual tools to develop and integrate an educator's pedagogical knowledge with intercultural competencies (ICC), to support the development of effective, objective, and inclusive student participation in global classrooms is required.

## Efficient collaborative online international learning requires rich international and pedagogical content knowledge

Digital technology was a catalyst for global learning and fostering cultural understanding (Reed, 2007). In response to the COVID pandemic in 2020, there was a worldwide pivot of education, government, and industry to online communication and the utilization of diverse digital technologies as alternatives for face-to-face communication. Within higher education, faculty were mandated to utilize digital technology in the conversion of lectures to recordings and the use of web tools for virtual interactions which created unprecedented challenges, with many educators unprepared and untrained to do so (Toquero, 2020). Yet, the introduction of online digital technologies as the primary medium in pedagogical interactions caused the expansion of previously limited curriculum prospects to now include global and international possibilities. With over 50% of the workforce continuing to work remotely in intercultural or global online communities, higher education must now support the growth of new digital communication learning opportunities such as Collaborative Online International Learning (COIL), to foster the development of ICC in our students for future career advancement in an expanding global community (Manzoor, 2016; Gartner, 2021).

ICC encompasses the ability to communicate with individuals from backgrounds of differing cultures, religions, and ethnicities in the global arena, a critically important skill required for students to develop into global citizens in our rapidly expanding multicultural world (McCloskey, 2012; McCalman, 2014; Fungchomchoei and Kardkarnklai, 2016; Habib, 2018). COIL is an innovative and effective learning approach to foster global ICC in students, and provide a rich international experience compared to traditional forms of physical mobility and academic exchange. The COIL approach utilizes novel digital teaching approaches to foster online student and faculty collaboration through the creation of co-equal learning environments, representing a novel approach to teaching and learning in the twenty-first-century classroom. Through engaging students in COIL, educators aim to impart ICC, necessary for both Students' professional and personal development, such as encouraging civil engagement through the reduction of ethnocentrism (Starke-Meyerring, 2010a,b). The assumption in COIL and other global learning networks is that participation develops Students' cultural sensitivity and enhances their learning experience. Bégin-Caouette (2013) analyzed several examples of global learning networks—referred to as eduscapes—and found an increase in intercultural sensitivity among students that engaged in

global collaborations (Bégin-Caouette, 2013). However, this appeared to be contingent on the level of cooperation between the educators and the degree of mutuality.

International or English as a second language (ESL) students seek to communicate effectively with others during intercultural encounters beyond simply English linguistic knowledge and skills (Fungchomchoei and Kardkarnklai, 2016). Importantly, international students expect respect and understanding of their diverse cultures, lived experiences, and perspectives through educators treating them in a socially just way (Ryan and Hellmundt, 2003). Lack of ICC on behalf of educators results in ESL students feeling undervalued and marginalized, which can detrimentally impact their studies and corrupt academic behaviors (Ryan and Hellmundt, 2003). Culturally responsive educators synthesize their broad understanding of cultural knowledge and prior self-experiences using frames of reference to evaluate the performance styles of ethnically diverse students, to provide informed and individualized learning encounters that achieve equitable and effective participation and outcomes for all (Gay, 2010). Where educators have established an appreciation of culture and actively demonstrated responsiveness toward diversity in the classroom, minority students have improved feelings of value, are more proficient in learning, and demonstrate increased engagement and achievement (Nieto, 1992; Gay, 2010; Aronson and Laughter, 2016). As Universities become more multicultural, educators must develop curriculum and provide pedagogical approaches that are "culturally sensitive, culturally responsive, and culturally relevant" (Dejaeghere and Cao, 2009; Schlein, 2018), but this is only possible when educators are equipped with ICC and are able to reflect upon their own cultural assumptions (Hajisoteriou et al., 2018).

Research in science education indicates that many educators lack a deep conceptual understanding of ICC, lacking adequate training in how to support all students participating objectively, equitably, and inclusively in intercultural relationships (Clifford, 2009; Etherington, 2014). According to Deardoff (2009), ICC is defined as "a person's ability to interact effectively and appropriately in cross-cultural situations based on his or her intercultural attitudes, knowledge and comprehension, and skills" (Deardoff, 2009). Three core components are addressed when developing an educator's ICC; attitudes or assumptions, knowledge or comprehension, and skills (Deardoff, 2009). Educators must be intrinsically motivated to learn, value, and respect other cultures to avoid ethnocentric *attitudes* or cultural *assumptions* of one's own culture (Gopal, 2011). Cultural self-awareness and *comprehension* of how one's own culture influences one's identity and behaviors will provide *knowledge* of how to target language, both verbal, non-verbal, and para-verbal. Indeed, educators must be critical of one's own communication *skills* with others and in self-reflection, as a classroom is not a culture-neutral zone. Failure of educators to recognize and reflect on the cultural assumptions they bring to the classroom or identify their unconscious biases can inadvertently marginalize minorities within intercultural groups or afford privilege to domestic students (Dervin, 2014). Strikingly, cultural variables can have a broad impact on academic behaviors and outcomes beyond the classroom, with cultural insensitivities shown to increase international Students' engagement in academic misconduct, including plagiarism (Boafo-Arthur and Brown, 2017). Yet in international faculties that demonstrate cultural responsiveness, international students' grades demonstrate significant improvement (Poyrazli, 2018).

Despite a rising acknowledgment worldwide that educators appear to be under-prepared to teach in an intercultural context (Hajisoteriou et al., 2018) there is a tenable lack of available tools. Moreover, some educators appear impervious to the requirement for ICC knowledge and skills (Deardoff, 2009). To fully harness the opportunities of COIL within the rapidly expanding global online digital education space, educators must equip themselves with an ICC toolbox. Conceptual tools such as content representations or CoRes to navigate the development of an educator's ICC within a global community of practice will enrich their pedagogical content knowledge (PCK) (Hume, 2010).

## Pedagogical content knowledge of intercultural competencies is required in the global classroom

Research has shown that one of the factors enabling educators to be effective, is their rich PCK (Jam, 2015). PCK uniquely combines content knowledge with pedagogical knowledge over time and through experience. First posited by Shulman (1987), and now a recognized form of professional knowledge, PCK is unique to each educator and gained only through teaching practice (Shulman, 1987). As educators are not "born" with PCK (Williams and Lockley, 2012), it is a process that requires continual development and guidance for early career educators to acquire both topic-specific and student-oriented skills and knowledge to become experts in their field.

Much of the PCK research is founded on how to teach early educators to teach science effectively. Friedrichsen and Dana (2005) proposed that there are three dimensions that underlie teaching orientations in science that require continued growth in educators for PCK development; (Leask, 2015) suitable subject matter knowledge (Leask, 2013) classroom experience, and (Reed, 2007) emotional behaviors and attributes (Friedrichsen and Dana, 2005). As an "educators' practice is highly influenced by what they already know and believe

about teaching, learning and learners" (Borko and Putnam, 1996), it is critical to provoke teachers' beliefs. It is therefore essential to enable educators to identify their own beliefs and understandings about teaching and learning practices in context to the environment within which they teach, to develop effective PCK (Fraser, 2015). It has been speculated that it may be difficult to change educators' inherent beliefs about teaching and learning, but this exact change is critical for educators to transform their teaching, hence the critical requirement for a diverse toolbox to support recognition of and navigation through, the PCK elements.

PCK is largely discussed in the context of providing a framework to assist educators interrogate their pedagogical practice, or for early educators to apply a lens over a topic within their curriculum. In a rapidly expanding global community, there is an increasing need for educators involved in multicultural classrooms or COIL programs to develop PCK of ICC to support equity in learning and professional training of students. Magnusson et al. (1999) proposed a five-element model PCK framework for science educators (Magnusson et al., 1999). The model's central element, "orientation to teaching *science*" is proposed to play a central role to balance the other 4 elements of PCK; (1) Knowledge of *science* curriculum (2) knowledge of students understanding of *science* (3) knowledge of instructional strategies *in science* and (4) knowledge of *science* assessment. Although an experienced educator's PCK will encompass all 5 elements in science within this model and be able to confidently demonstrate topic-specific and student-oriented skills and knowledge, it is highly unlikely many could complete the PCK framework when substituting *science* for ICC (**Figure 1**).

Significant research by Loughran et al., 2004, 2008, 2012 in science teacher education, has investigated a novel pedagogical approach to support early career educators conceptualize their professional learning and create a framework for their own PCK development using a "content representation" or CoRe tool. The CoRe tool which explicitly separates a particular topic into divergent, yet linked dimensions of the knowledge and skills attributed to its content, teaching, and learning, is ideally placed as a novel tool to support educators in their professional learning and creation of a PCK framework to ICC.

## Content representation conceptualization of intercultural competencies

CoRes were first reported by Loughran et al. (2004, 2008), to be diagrammatic representations of aspects of expert teachers collective PCK related to the teaching of specific science topics e.g., chemical reactions to particular students (Loughran et al., 2004, 2008, as discussed and represented in Hume, 2013). The CoRe framework represented as an interactive matrix (**Table 1**)

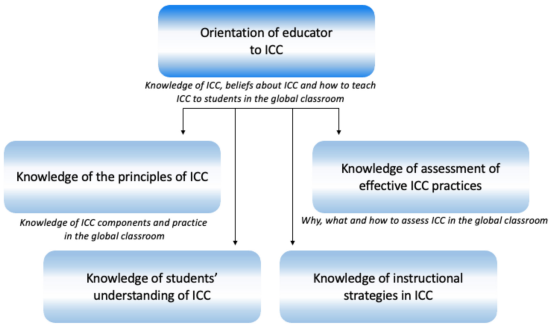


FIGURE 1
Components of PCK for implementing ICC in global classrooms. The *Orientation of the educator to ICC* including beliefs about the goals and purposes of teaching ICC and how to instruct students in ICC within global classrooms is central to an educator's PCK. The orientation of the educator to ICC is instructed by 4 other linked, yet diverse elements; (1) knowledge of ICC principles and practice (2) appreciation of the knowledge of the Students' understanding of ICC synthesized with (3) knowledge of appropriate instructional strategies in ICC, and (4) knowledge of efficient assessment practices to effectively assess the Student's understanding of ICC in the global classroom.

is completed as multiple "Big Ideas" or core concepts about a particular topic at the head of the columns, are addressed by considering a set of 8 pedagogical questions aimed to create a holistic overview of an educator's PCK related to the teaching of a particular topic (Loughran et al., 2004, 2008; Hume, 2013).

Findings of multiple studies of science teachers have revealed that there are beneficial mutually informing outcomes from the discussions between experts and early career teachers when discussing the key concepts and pedagogical approaches relating to the topic of CoRe and the ways to teach them (Loughran et al., 2004, 2008; Hume, 2013). Yet, it has been identified that across disciplines there are historical differences in conceptual thinking, that teaching practices may differ in how the learning area is taught and importantly the traditional backgrounds of the teachers in those learning areas may be diverse. This suggests that the CoRe matrix may not be appropriate for all learning areas, although it is exactly the nature of educator diversity that underlies cultural assumptions in ICC frameworks and to which the CoRe matrix would provide immense benefit in the creation of an educator's PCK of ICC and the development of a global community of practice. As seen in **Table 1** (adapted from Loughran et al., 2008; Hume, 2010, 2013) the CoRes matrix contains all 5 components identified by Magnusson et al. (1999) to gauge and guide PCK development in science teaching, which can be robustly applied to the dimensions of ICC (Magnusson et al., 1999). The first column contains the 8 pedagogical prompts originally proposed by Hume (2010), with reference to proposed ICC PCK prompts in the corresponding column, that can be used to guide an educator to develop their unique PCK on multiple core "ICC concepts." Suggested ICC

concepts 1–3 are framed at an individual level, in a first step in understanding self and acknowledging one's conscious or unconscious biases or stereotypes, enabling the educator to reflect on themselves while considering their students own core ICC concepts. The ICC CoRe matrix can be applied in any classroom in which students of different cultures engage in teaching and learning together. Whether students are participating in group work activities in a physical classroom as part of their discipline training or in specifically designed intercultural experiences in COIL programs online, educators and students need to go beyond the structural diversity and make it a learning asset. In consideration of the intercultural classroom, multilingual students experience broad language barriers and therefore rely heavily on non-verbal behaviors that can contribute to as much as 65% of communication. In an online teaching platform as opposed to a physical classroom, specific etiquette and processes need to be applied, in addition to considering the ICC concepts within the CoRe matrix. Consideration of the exemplar CoRe matrix (Table 1) to teach ICC in a COIL program will require the educator to:

- identify and justify the key concepts underlying educating students in ICC to enable the educator to identify their own orientation to teaching ICC, forming the foundation of their PCK
- identify prior knowledge gained from evaluating classroom experiences, synthesized with lived experiences, to guide

TABLE 1 Content representation (CoRe) matrix to assist educators develop their PCK in ICC, adapted from Loughran et al. (2004, 2008) and Hume (2010, 2013).

| **Pedagogical questions or prompts** | **ICC pedagogical questions or prompts** | **Key concepts of topic: "Developing a Student's ICC in a COIL classroom"** | | |
|---|---|---|---|---|
| | | **ICC concept 1 Value diversity through considering differences as strengths** | **ICC concept 2 Be self-aware of personal biases against people of different cultures and work to eliminate them** | **ICC concept 3 Be aware and accept that communication, etiquette and problem solving are culturally prescribed** |
| What you intend the students to learn about this idea? | What is important for domestic and international students to learn about this ICC concept? | | | |
| Why is it important for the students to know this? | Why is it important for domestic and international students to know this? | | | |
| What else you might know about this ideas (that you do not intend the students to know yet)? | What do you know about this concept that students need to discover? | | | |
| Difficulties/limitations connected with teaching this idea. | What cultural assumptions, biases, difficulties, or limitations are connected with teaching this concept? | | | |
| Knowledge about Students' thinking which influences your teaching of this idea | What is your knowledge of domestic and international Students' ICC thinking that will influence teaching this concept? | | | |
| Other factors that influence your teaching of this idea | What are your cultural assumptions or biases that may influence your teaching of this concept? | | | |
| What teaching strategies will you apply, teaching procedures (and particular reasons for using these to engage with this idea) | What teaching strategies will you apply and why, to effectively engage with this concept? | | | |
| Specific ways of ascertaining Students' understanding or confusion around this idea | How will you evaluate student interpretation or misunderstanding of the concept? | | | |

the instruction and application of ICC to students involved in a COIL classroom
- identify common cultural assumptions that may impact Students' understanding of communication, etiquette, and problem solving in the COIL classroom to participate objectively, equitably, and inclusively
- devise appropriate instructional strategies and activities to encourage reflection on cultural differences, assumptions, and biases that could exist in COIL classroom and develop acceptance of responsibility from students to acknowledge, accept, understand, and adapt to the dynamics of difference
- devise appropriate assessment strategies to evaluate students' understanding and application of ICC in COIL classrooms.

In consideration of the pedagogical prompts within the CoRe matrix (**Table 1**), the 4 dimensions of ICC, intercultural knowledge, intercultural attitude, intercultural skill, and intercultural awareness are addressed, demonstrating the robust nature of the application of the CoRe matrix in the development of an educator's PCK in ICC in the COIL classroom (Fantini, 2007).

## Concluding remarks

Despite the increasing literature on PCK for linking of communities of practice in discipline-specific contexts, in the wake of the pandemic which highlighted the exponentially expanding global online community in which we learn, how we navigate intercultural communication within this new digital space lacks discussion. This paper argues, that with the recognition of the opportunities for authentic-based learning with real global intercultural learning experiences, educators require global communities of practice to enhance educator's PCK of ICC to empower students in becoming global citizens. As each educator's own traditional cultural backgrounds and beliefs within the learning area of ICC are diverse, this provides the exciting opportunity for the creation of global communities of practice comprised of members from diverse disciplines and across international borders to develop PCK of ICC. Indeed, novel PCK models are now incorporating technology, the technology pedagogical content knowledge model (TPCK) (Mishra and Koehler, 2007) and the global pedagogical content knowledge model (GPACK) (Urban et al., 2018) to move beyond an exclusive knowledge area of PCK, and instead integrate pedagogy and content with global concepts to support the internationalization of learning. With the shift to global learning and increasing diversity in our multicultural classrooms, it is critical to collaboratively design more well-developed ICC CoRe matrices, to develop confidence in our COIL educators, and to ensure students participate objectively, equitably, and inclusively in the twenty-first-century classroom. Further research is now needed to explore student outcomes in developing and demonstrating ICC in COIL classrooms, and to better understand how best to support early career and expert educators in engaging in the development and use of ICC CoRe frameworks.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

## Author contributions

JB conceptualized, researched, visualized, wrote, reviewed, edited, and acquired funding.

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## Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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