

FIRST STEPS IN REALISING INTERDISCIPLINARITY, CREATIVITY, EMPATHY AND GLOBAL PERSPECTIVES IN STEM CURRICULUM

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AIMS

What we accept as science today comes from a worldview that privileges Eurocentric ways of knowledge making over neo-indigenous and indigenous epistemologies (Ogawa, 1989; Snively and Corsiglia, 1999; Aikenhead, 2001). If we indeed desire to create a STEM curriculum that fosters creativity, empathy and values global experiences and perspectives, it is necessary for science education and science educators to recognise and examine assumptions that constitute the notion of 'universal science' (Gough, 2001). This presentation originates from reflections on discussions had by an interdisciplinary team consisting of science, indigenous education, and literacy and curriculum specialists in the course of designing a first year foundational Indigenous science unit. It aims to offer a theoretical construct grounded on the scholarship of Aikenhead and Ogawa (2007) to inform curriculum design for a cross-cultural foundational STEM unit.

SOURCES OF EVIDENCE AND MAIN ARGUMENT

As our lives become increasingly globalised, there has been growing acknowledgement of the capacity of non-Eurocentric/Western epistemologies that have traditionally been discredited or trivialised to offer sustainable perspectives on knowledge of the natural and social world (Kuokkanen, 2007; Mignolo, 2009). The growing impetus to embed Indigenous perspectives in Australian higher education curricula is a testament of this acknowledgement (Nakata, Nakata, Keech & Bolt, 2012; Universities Australia, 2011). However, in tandem with this position, there is also a need for a broader understanding of the impact of a hegemonic Eurocentric worldview of science on the science learning experience of students whose cultures and languages differ from the predominant Eurocentric culture and language of present day 'universal science' (Aikenhead and Ogawa, 2007). Such an understanding will not only facilitate better science education outcomes for all but also reflect the aims of both the call to internationalise higher education, and related imperatives to develop relevant and appropriate graduate capabilities, and thus employability, in times of global uncertainty and disruption (Hess & Ludwig, 2017; Oliver, 2015). The aim being "preparing 21st Century Graduates to live in and contribute responsibly to a globally interconnected society" (The Higher Education Academy, 2014).

Science is a global endeavor and therefore contextualising it through internationalisation is a way forward. Internationalisation is defined as "the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of post-secondary education" (Knight, 2015). These dimensions are eminent for STEM students to develop a humanics approach in the enactment of their future STEM careers. To allow for the integration of an intercultural or global dimension in STEM education, it is necessary to trouble the philosophical foundation of "universal science" as it stands presently as a monocultural paradigm of knowledge making. Effort is needed to rediscover and/or transform our understanding of our place in the world, to recognise that all ways of being and knowing do not necessarily radiate outwards from, nor reflect, a central Eurocentric locus (Mignolo, 2009).

This 'troubling' is particularly relevant if the intention is to facilitate student reflection upon the epistemic and ontological foundations of their discipline and, by extension, transformation of their own

perspective as a practitioner within that discipline (Mezirow, 1990). In the first instance, it is necessary to understand how diverse paradigms of knowledge creation are acknowledged and reflected in the statements that underpin the Threshold Learning Outcomes for Science (Australian Teaching and Learning Council, 2011).

CONCLUSIONS

It is only by examining and troubling constructs and re-framing our beliefs as STEM educators can we realise our aspirations of a STEM curriculum that attends to the foundations of humanics; the need for empathy and respect for a multitude of perspectives - disciplinary, social and cultural differences - in the business of knowledge creation.

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