

Doctoral Thesis: Poh Tan

Title: Extending Scientific Literacy through Indigenous Hawaiian Epistemology: Navigating Scientific Seas with Hula

Abstract

My educational journey and endeavours are deeply rooted in the natural sciences, particularly the biological sciences. Specifically, my science background focused on stem cell biology, regenerative medicine, genetics, and oncology (cancer research). I spent years experimenting with different cellular pathways to understand and contribute to the field of knowledge in stem cell and cancer research. My commitment to scientific rigour and ways of acquiring knowledge is rooted deeply in the objectivity, validity, and reproducibility of experiments and scientific outcomes. Sometimes I felt emotionally disconnected, to the larger picture of my research work. After the birth of my first child, I realized that study and practice in science meant much more than seeing the world through a microscope's 100x magnification lens. I sought to understand my identity as a scientist and scientifically literate person who is also a mother, educator, researcher, entrepreneur, and *haumana* (student) hula (Hawaiian cultural dance).

What characteristics best define such a scientifically literate person? What does practicing science from one's mind, heart, and spirit mean? How does teaching and learning sciences from the mind, heart, and spirit reveal an expansive, culturally-inspired pedagogy of scientific literacy? I address these questions through an Indigenous Hawaiian framework and seascape methodology and, specifically, through a deep connection, evolution, and growth with hula and Aloha. Through this emblematic practice of Hawaiian Indigenous epistemology, a reflectively emergent voyage traversing both fields of science and education, a deeper relationship with science is revealed. My experiences, realizations, and stories on this journey appear and re-appear like swells in the ocean, each holding a meaningful reflection, an introspection, and a sense of relationality contributing to my emerging identity as a science educator.

This study is intended to prompt dialogue on the importance of multiple ways of acquiring scientific knowledge beyond laboratory experimentation. It highlights the challenges of transforming one's identity as a scientist and science educator in keeping with the relational understandings of hula practice and finally riding the waves of being both scientist and dancer.

My personal and professional commitment to transformation continues beyond the pages of this thesis as I continue to deepen my heart, mind, and spirit as a scientist and science educator.

Keywords: science education; scientific literacy; Hawaiian epistemology; seascape methodology; Aloha, hula