

THINKING OUTSIDE THE WESTERN STEM BOX

Janice Crerar^a, Johanna Funk^b

Contact Author: Janice Crerar (janice.crerar@cdu.edu.au)

College of Indigenous Futures, Education and Art, Charles Darwin University, Northern Territory 0815, Australia

THEME:

Innovative STEM pedagogy and curriculum

BACKGROUND AND AIMS

Political and social interest and demand for increasing STEM capacity in education and workforce reflects a global discourse about the 4th Industrial Revolution (4IR) (Effoduh, 2016). This is the context for STEM Education in Australia in 2022 but it is not necessarily reflective of socially innovative or inclusive education

The privileged disciplines of Western Science, Technology, Engineering and Mathematics (STEM) effectively silences the voices of people who fall outside of models of traditional western knowledge systems (Harding, 2016). This means that women, Indigenous people and holders of other traditional science knowledge are constrained in their ability to embody or participate in science (Woodroffe et al, 2021).

There is greater recognition of Indigenous knowledge and cultures than previously, but this is not well expressed in the Australian Curriculum. Equally, the discipline areas remain separated into their parts. The current status of the Curriculum in relation to contemporary discussions about STEM and Indigenous histories and cultures calls for questions:

1. To what extent does the Australian Curriculum adequately provide scope for integrated learning of STEM in compulsory education?
2. How can we respectfully and rigorously integrate Indigenous knowledge systems with STEM education?

The aim of the paper, and the pilot project, is to ascertain if we have created a framework for effectively engaging preservice teachers in equitable and inclusive STEM education.

METHODOLOGY OR PROCESS(ES) UNDERTAKEN

The researchers reframed a pilot project for a third year online only undergraduate STEM pedagogy unit prioritising Indigenous science to engage in an authentic way to holistic science knowledge. Results of the pilot project will provide insight into modifications for semester 2 framework for presenting the integrated unit science education unit that will engage students in authentic and holistic science knowledge.

RESULTS AND CONCLUSIONS

Results and conclusions will be available by time of the conference as the data will be analysed in August/September when the assessment period for the semester is over and data will become available.

REFERENCES

Woodroffe, T., Wallace, R., Guthadjaka, K., Funk, J., Maypilama, E. L., Ireland, S., Adair, R., Ober, R., Armstrong, S., Lowell, A., & Pollard, K. (2021). Indigenous Women in Science: A proposed framework for leadership, knowledge, innovation, and complexity. In W.

2022. J. Bobis & C. Preston (Eds.), Proceedings of the 7th International STEM in Education Conference (STEM 2022), University of Sydney, Sydney, Australia, November 23-26. University of Sydney.

James, C. Çobanoğlu, & M. Çavuşoğlu (Eds.), *Advances in Global Education and Research* (1 ed., Vol. 4, pp. 1-16). University of South Florida M3 Center. <https://doi.org/10.5038/9781955833042>

Effoduh, J. O. (2016). The Fourth Industrial Revolution by Klaus Schwab. *The Transnational Human Rights Review* 3. <https://digitalcommons.osgoode.yorku.ca/thr/vol3/iss1/4>

Harding, S. (2016). *Whose science? Whose knowledge? In Whose Science? Whose Knowledge?*. Cornell University Press.