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# Mātauranga and Science – Introduction

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*Mātauranga Māori is not like an archive of information but rather is like a tool for thinking, organising information, considering the ethics of knowledge, the appropriateness of it all and informing us about our world and our place in it. (Mead 2003, p. 306)*

Māori have become a pivotal force in New Zealand's science system, with the torsion of tikanga Māori inviting the system to open its doors to indigenous values. Increasingly mātauranga Māori – encompassing Māori knowledge, Māori methods of knowledge creation and Māori ways of knowing – is being consulted, aligned with or brought into conversation with science. As the guest editors for *Mātauranga and Science in Practice*, we wanted a space in which people who are engaged at these interfaces could share their experiences of working with mātauranga alongside New Zealand science, bound as it is by inherited norms, practices, institutional traditions, and various Crown policies. The audience for this conversation includes tohunga, philosophers, scientists, kaumātua, researchers, academics, kaiako, communities, public servants, kaimahi, students and anyone else who is interested in science, more broadly, and the unique contribution that an Aotearoa New Zealand science could make to the world.

Public science policies – particularly Vision Mātauranga – present an expectation to researchers and educators that their practice will engage with mātauranga Māori. The research, curriculum and project design that has emerged from this is ground-breaking and world-leading, but may go unremarked, and may have occurred by accident, or trial and

error as much as by design. For what purpose is this work done, and what are the outcomes? What are the opportunities and challenges of this work? How are science research projects formulated alongside mātauranga, in practice? Mason Durie (2005) spoke of certain values that ought to drive practice at the interface: are these being realised? Are there genuinely mutual benefits of this work? What capabilities are needed in relationship building (or reframing), understanding other ways of knowing and bridging knowledge systems? This special issue foregrounds the experiences of Māori scientists, researchers and educators, presenting them alongside their Pākehā and tauwi allies. We present a variety of cases that span institutions, disciplines and domains. We invited submissions on a variety of themes, suggesting that prospective authors consider Vision Mātauranga and other policies, Treaty principles, institutional policy and practice, pūtaiao (science) and mātauranga in Western institutional settings, Indigenous knowledge or traditional ecological knowledge, science-mātauranga interfaces in educational, policy and research settings, and how mātauranga and science produce innovation.

We are delighted that Prof. Juliet Gerrard, as Chief Science Advisor to the Prime Minister, and Prof. Tahu Kukutai, member of the Advisors' Forum, have co-written a foreword for this issue. Gerrard is known for tackling the plastics problem, but she has also shown leadership in prioritising the contribution of mātauranga to science, shaping a more diverse science system and transforming our ideas about who is (and thus can be) a scientist. Kukutai is known for her ground-breaking demographic research with communities and long experience in working at epistemological interfaces. These two wahine toa model productive conversation between mātauranga and science.

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**Ocean Ripeka Mercier** (Ngāti Porou) is Head of School at Te Kawa a Māui (the School of Māori Studies) at Victoria University of Wellington, Aotearoa New Zealand. She has a PhD in materials physics. Her teaching and research examine the connections between mātauranga Māori (Indigenous Māori knowledge) and science, particularly in the contexts of education and in cultural mapping. She is a presenter on TVNZ's *Coast New Zealand*, and the presenter of Māori Television's science show *Project Mātauranga*. Her work in science communication saw her receive the New Zealand Association of Scientist's Cranwell Medal in 2017 and the Royal Society: Te Apārangi Callaghan Medal in 2019.

**Anne-Marie Jackson** (Ngāti Whātua, Ngāti Kahu o Whangaroa, Ngāpuhi, Ngāti Wai) is a Senior Lecturer at the School of Physical Education, Sport & Exercise Sciences, Te Koronga, Te Tiaki Mahinga Kai, University of Otago. She has a doctorate in Māori studies and physical education, examining rangatiratanga and Māori health and well-being within a customary fisheries context. Her research focuses on the examination of Māori conceptualisations of physical education and health, rangatiratanga and the right to self-determination, the role of the Tiriti o Waitangi for Māori health and Māori approaches to research.



We received many submissions and have split the contributions across two issues. In this, Special Issue I, we present five articles on varied topics. The triple project of: building Māori capability in science; building non-Māori capability in tikanga, kaupapa Māori and mātauranga; and reshaping policy and institutional systems is evident in all of these contributions.

Is there such a thing as Māori science? Can mātauranga Māori be considered a science? These questions have long been debated, polarising opinions on either side. In *Mātauranga and Pūtaiao: the 'Māori science' debate in education*, Georgina Stewart gathers the key arguments on both sides and takes a fresh and clear-eyed look at them. She acknowledges that the question can probably never be resolved, questioning whether it necessarily needs to be. She considers the impact of the political, philosophical and epistemological aspects of the debate in relation to policy, education and public science. School teachers and students encounter these tensions quite early, through Pūtaiao, the Māori language science curriculum. The Māori science debate remains a critical question in the development of rangatahi capability in and across dual knowledge systems, and may be crucial in their decision to continue on as scientists. Engagement in this 'provocation and opportunity for learning' is critical to understanding the broader political, philosophical and epistemological tensions that Māori in New Zealand science must navigate.

Anne-Marie Jackson leads a host of authors engaged in leading or steering Te Koronga, a Māori research excellence mission based at the University of Otago. In their 'thoughtful and constructive' contribution *Towards Building an Indigenous Science Tertiary Curriculum*, they present their experience of building curriculum and capacity in science at Otago University as a case for seeding and growing Indigenous sciences within tertiary institutions more broadly. With a clear goal to lift Māori academic staff numbers at Otago University from 3% to 15% (population parity), their work is a response to the rising crescendo of calls (see McAllister *et al.* 2019; Naepi 2019) for universities, Tertiary Education Commission and associated bodies, to urgently address the dire paucity of Māori and Pasifika academic staff. This submission is presented as a 2-parter, with Part II to appear in Issue II of NZSR's *Mātauranga and Science in Practice*.

In *Whāia ngā pae o te māramatanga: our horizons of pursuit*, we hear from past and present directors of Ngā Pae o te Māramatanga (NPM), New Zealand's Māori Centre of Research Excellence. Jacinta Ruru, Linda Waimarie Nikora, Tracey McIntosh, Tahu Kukutai and Daniel Patrick consider how NPM has, over its 17 year history, built Māori capability and leadership in research, and addressed key challenges and opportunities at the interface between mātauranga and science. As a Māori-led nationwide institution, NPM has built wide networks, providing opportunities for trans-institutional and trans-disciplinary Māori research that produce positive outcomes for communities, as well as ameliorating some of the institutional hostility that Māori researchers experience. A spotlight is thrown on some of their key Māori researchers who credit NPM with making their careers. Indeed, NPM has supported the growth of

Māori research capacity to the point that NPM researchers are now bidding for their own Centres of Research Excellence. It is hard to argue that NPM has been anything but a transformative force in not just research, but positive societal change.

We turn the spotlight onto the educational and development needs of scientists next. Chris Hepburn and co-authors seek to better prepare science students for career work in context, alongside and with Māori communities, for example. Key to this is developing students' ethical, social, environmental and cultural capabilities. In *Teaching the next generation of scientists to support communities in their restoration of ecosystems and ways of life*, they discuss a University of Otago 'Field Methods' course, a collaborative endeavour that connects science students with the community at Kāti Huirapa ki Puketeraki, supporting customary fisheries management in a way that provides mutual benefits for all involved.

Finally, in *The high-tech interface*, William John Martin and Katharina Ruckstuhl discuss their involvement in one of the National Science Challenges as Kāhui Māori members. While there are few Māori with science and technological capacity as researchers in their theme, Science for Technological Innovation, Māori are nonetheless involved in contributing and building human relational capacity. Their Te Tihi o te Maunga model is a 3-dimensional guide to mapping projects within the Challenge, identifying strengths within these projects in relation to Māori knowledge, participation and benefit, and identify gaps across the sector. It is a model that could be used to assess Māori or Indigenous participation and benefit within any system.

Special Issue II will be released shortly. Papers in that issue will continue discussing mātauranga in educational and research contexts. The collective experience gathered here forms a resource that helps us all to better understand how this work can advance Aotearoa New Zealand's public knowledge ecosystem.

*Ngā mihi ki a koutou katoa  
Ocean and Anne-Marie*

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