

Mātauranga and Science II – Introduction

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*Haere mai te ihi
haere mai te wehi,
haere mai te mana,
haere mai te tapu.*

‘Draw near o excellent ones,
draw near o awesome ones,
draw near o charismatic ones,
draw near o sacred ones’ (Marsden, 2003, p. 3)

This second edition offers additional definitions and examples of mātauranga and science in practice, and advances the basis of such scholarship, across a range of contexts. The papers highlight the relevance, innovation, and dynamism of mātauranga. It questions the taken-for-granted assumptions of scientific thought which are deeply entrenched in modern society and rather encourage us to seek ‘a passionate, inward subjective approach’ (Marsden, 2003, p. 22–23) as perhaps ‘abstract rational thought and empirical methods cannot grasp the concrete act of existing which is fragmentary, paradoxical and incomplete’ (Marsden, 2003, p. 22–23). The contributing authors reflect the breadth of experiences

in mātauranga and the need for research that is written by those knowledge holders and practitioners of mātauranga. This Special Issue offers a hopefulness to Smith’s (1999) caution that, too often, Māori and indigenous peoples were the subject of study as the ‘other’. This caution was seen too frequently in scientific study historically, but sadly, still occurs today, at societal, systemic, political, community, and individual levels. Yet, despite these circumstances, we are reminded of a whakataukāki a prominent chief to Ngāti Whātua¹, Ihenga uttered in the context of an ongoing battle:

Me whakapakari ki te hua o te kawariki

‘Leave us and we will mature like the fruit of the kawariki’

This is an oft-heard remark at marae in Ngāti Whātua referring to the ongoing strength of our whānau as, like the resilient kawariki, a plant that can survive and flourish in an ever changing environment.

Dr Jessica Hutchings and Dr Willy-John Martin, who are members of Te Rauika Māngai, the strategic Māori leadership group across the National Science Challenges, provide the Foreword to this Special Issue. Both are well respected Māori

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researchers in their own right, and they are at the forefront of leading the strategic implementation of mātauranga, Vision Mātauranga within the National Science Challenges for the benefit of iwi, hapū, whanau, Māori communities, and all New Zealanders.

We bookend this Special Issue with two papers that draw upon arguably one of the greatest Māori scientific feats – the intentional navigation of our voyaging waka to Aotearoa. The kei (stern) of the waka is Kipa Morgan and Robyn Manuel's paper, in which they trace a whakapapa (origin) of Western scientific thought as well as indigenous wisdom. They articulately give voice to commonly held assumptions regarding the divergence of Western science and indigenous wisdom. Two of those assumptions are the isolation and compartmentalisation of the world compared to a more holistic, relationship-based understanding, and the important recognition of spirituality and non-physical attributes of the world around us. Their directive of the need to understand the difference between 'know how' and 'know why' is pertinent for any person interested in the study of science.

Rangi Mataamua, Pauline Harris, and Hemi Whaanga discuss the rise and interest in Māori astronomical knowledge, with a particular focus on Matariki (Pleiades). In Aotearoa, there has been a resurgence in the study and celebration of Matariki. Their paper discusses the astronomical knowledge, mātauranga, and science of Matariki. They dismantle the Gregorian calendar and propose the need to decolonise the calendar and, indeed, modern assumptions of time. They appropriately conclude that a major challenge 'lies in bringing together the collective knowledge, experiences and voices to ensure its authenticity and legitimacy for future generations of aspiring Māori astronomers'. Indeed, this is a take (issue) of significant relevance for many who are navigating similar pathways.

There are major issues in the 'pipeline' for science education. The next two papers highlight solutions in science education: one in a kura kaupapa (Māori medium primary schooling) and the other in tertiary.

Georgina Stewart and Peter Buchanan's paper details their development of a resource called Ngā Hekaheka o Aotearoa for pūtaiao, the science curriculum, in kura kaupapa, which they describe as being in a 'crisis'. Their paper discusses the process of creating the resource and how the team worked together bringing their strengths and perspectives. Their paper serves as an important example for other teams, in how they might create new resources in the primary or any educational setting (whether in schools or elsewhere).

Colleagues of Te Koronga, based at the University of Otago, detail their proposed plan for the introduction of an indigenous science major at the University of Otago.

This paper builds off their paper in the prior Special Edition. Growing mātauranga-led curriculum has particular challenges in the mainstream tertiary setting, and more so in sciences. There are limited examples in tertiary science education for training the next generation of researchers. Their paper offers a realistic solution to address this gap within a mainstream setting.

The next three papers describe examples of the application of mātauranga and offer further description that mātauranga is what is known, as well as its application and use.

Kura Paul-Burke, Tuwhakairiora O'Brien, Joseph Burke and Charlie Bluett's paper examines Māori knowledge in the context of marine management. Co-written with iwi leaders, they describe mātauranga in action and highlight the findings of a study in Ngāti Awa. They studied four marine species of importance to Ngāti Awa, and indeed many Māori, through historical intergenerational knowledge alongside quantitative techniques to assess location, the size and number of these species. At times, blending 'mātauranga' and 'science' is criticised, as often one does not do the other justice, or mātauranga is not seen as *real* science, for example. Their approach provides a positive exemplar of how to do this style of research appropriately alongside, and led from within, an iwi context.

Maui Hudson leads a team of University, iwi and business researchers including Hemi Whaanga, Jordan Waiti, Hohepa Maxwell, Kyle Davis, Te Awhina Arahanga, John Proctor, Matt Sword, Thalia Ulrich and Mike Taitoko. Their paper expands definitions of mātauranga and stresses the importance of mātauranga as being 'dynamic, innovative, and generative system of knowledge constituted from mātauranga ā-whānau, mātauranga ā-hapū, and mātauranga ā-iwi'. They also discuss additional mediums for the transmission of mātauranga, with a particular focus on geospatial tools. With the rise of these additional mediums, they discuss the challenges of iwi, hapū, and whānau mātauranga being more accessible and the need to have tikanga that still governs their use.

In light of the need for changes in policy from the whole system, the next paper is led from the Environmental Protection Agency (EPA) Manahautū Kaupapa Kura Taiao Doug Jones' team. The EPA is the 'government agency responsible for regulating activities that affect New Zealand's environment'. They draw upon the metaphor of a waka hourua, which is the symbol of the mātauranga work programme within the EPA, to describe their partnership approach to embed mātauranga into decision-making. As a Crown agent, it is unsurprising the authors bring forward a strong Treaty of Waitangi lens into their work. Their work offers an interesting example of a process, and steps, that institutions and teams within those institutions can follow to ensure their

organisation 'better understands and values Māori perspectives and mātauranga'. These key findings and lessons are critical for all institutions trying to interact with one another.

Our final paper, which is at the ihu of our collection, draws upon concepts of migration. A timely article which interrogates our notions of migration: of people, of scientific thought, and of culture. This paper perhaps has more relevance than ever, as we write this introduction at a time where New Zealand's borders are closed to the world. Arama Rata discusses Cook's legacy in relation to science, migration, and colonialism. She provides an additional narrative to the paper which began this Special Issue, and suggests pathways for the study of migration into the future. Her paper brings about an important, infrequently discussed issue in relation to mātauranga, and opens a space to critically evaluate notions of migration in this new world.

He kupu whakamutunga Final words

We would like to express our sincere thanks and gratitude to the 100 plus contributors and reviewers to these two editions. Collectively the papers add pou (stakes) in the ground in re-defining and re-examining our notions of mātauranga and sciences in practice. We thank Keanu Townsend, who is the Māori artist who designed the covers for the journal issues. We are grateful to Eru Kapa for translating article abstracts into te reo Māori. We also thank the *New Zealand*

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Me whakapakari ki te hua o te kawariki.

Like the kawariki we shall flourish.

Nō reira,

Ka mutu māua i konei. He mihi whakamutunga ki te runga rawa, nāna nei ngā mea katoa. Āpiti hono tātai hono, rātou te hunga wairua ki a rātou. Āpiti hono tātai hono, tātou te hunga ora ki a tātou nei. Mauri ora ki a tātou.

Nā,

Anne-Marie māua ko Ocean

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