

# **Mātauranga Māori and the School of Science**

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## **Abstract**

This is a reflective commentary or thinkpiece paper written as the only Māori member of the internal panel convened to review the curriculum and operations of the School of Science of AUT, my employer university. It is a personal viewpoint intended as an input for the deliberations of the panel in writing their report. It is the second of two related papers on the depth and breadth of the thinking required of a Māori academic like myself, charged with representing the urgent issues under the heading of Te Tiriti o Waitangi currently facing all eight local universities within the peripheral local academy of Aotearoa New Zealand.

## **Keywords**

Biculturalism, Mātauranga Māori, Science, Te Tiriti o Waitangi, Universalism

## **Introduction**

AUT's School of Science is currently being reviewed, and I am the only Māori member of the review panel. As such, I take particular interest in Māori and Indigenous issues, and intend this paper as an academic koha (contribution) and input for the review process. I satisfy two criteria rarely found together in one person: both qualified in science AND fluent in te reo Māori: I am bilingual, disciplinarily and culturally speaking. Formerly I was a secondary science teacher; I've written curriculum documents for MoE and NCEA qualifications for NZQA. I am a critical Māori curriculum theorist and a Māori philosopher of education. For over 20 years I have studied the relationship between science and Māori knowledge. I aim to use my background knowledge, and the tools of scholarship, to comment on Māori knowledge in the past, present and possible futures of the School of Science. Written in late 2022, this paper is the second of two being published together, the first focusing on Māori concepts in university ethics. It builds on my extensive record of relevant publications, including a recent commentary for secondary

science teachers on the introduction of Mātauranga Māori into NCEA Science qualifications (Stewart, 2022, in press).

Despite its ‘universal’ sounding name, the School of Science houses only some of the major science divisions; for example, physics teaching and research takes place elsewhere within AUT. Additionally, for arbitrary reasons, the School of Science is home to disciplinary groups that properly belong in other Schools. The name ‘School of Science’ is thus ill-fitting for its current structure. To bring those other science domains back into the ‘fold’ of the School is out of scope of the current review. Yet the identity of the School of Science remains a topic of interest, theoretically and practically, and to various groups in particular, including Māori and Pacific staff, students and their communities. The key question guiding the review concerns its identity: What is AUT-distinctive Science?

I will focus on this question in the context of the future identity of the School of Science, and specifically in relation to Objective 1 of the review, which is to ‘position this review and its outputs in the context of a future Te Tiriti-centred School of Science’ (ToR). Mindful that the School’s name is key to establishing and advancing its identity under which all its work operates, I discuss the potential contribution that Mātauranga Māori, or Māori knowledge, can make to this review.

There is intense current interest in combining Indigenous knowledge and science shown by top global science journals, such as the recent feature in *Nature* (Powell, 2018) on work at Otago University by Anne-Marie Jackson and colleagues (Jackson, 2015; Mercier & Jackson, 2019). In the public domain, too, Māori knowledge and environmentalists are ‘leading the way’ in conservation and restoration of our lands and waters (Hall, 2022). One of the School’s researchers is actively developing projects in the Pacific that are aligned with this direction. We would surely be like the proverbial ostrich *not* to know that diversifying the thinking in science through partnering with Indigenous knowledge is one of the most topical of all questions currently facing all university science education and research. A ‘critical mass’ of Māori and Pacific scientists is being provisioned for the future of the School, almost as an underground movement, given the current climate.

***A conceptual problem: The ‘Te Tiriti’ discourse***

The current round of debate about Māori-Pākehā relations in the academy is being pursued largely under the heading of ‘Te Tiriti’ - short for Te Tiriti o Waitangi, or the Treaty of Waitangi – although whether or not these are two names for the same thing, or two different things, is a key question pointing to the philosophical conundrum at the heart of this whole debate.

The current review is an opportunity for a strategic intervention to the direction and future of the School and its identity. Simply based on scale and quantitative economic resource, there is no point trying to compete with or replicate a comprehensive programme of teaching and research in basic science, such as is found in much larger science faculties, including in other local universities. If this basic point is accepted as valid, the question then becomes: What is the best identity for the School to adopt, and what name would best reflect this new identity? I take this opportunity to comment on this question, and its underpinnings, from a critical Māori science perspective. First, it is necessary to burn some dead intellectual wood.

***“Ghosts of Science Past” (with apologies to Charles Dickens)***

Speech acts of overt racism are illegal and have no place in the School of Science. It is important to acknowledge the pain and burden carried by those who have been direct targets of such acts. That pain creates a kind of ‘referred pain’ in the sense that it is shared by all Māori and Pacific staff, and, ultimately, students and their communities. These events and their ramifications circle back to the way things operate in the School, which adds to an ongoing organisational ‘culture’ recognised as negative by the review panel, arguably to the point of impeding the School’s ability to progress in terms of the objectives of the review.

No amount of other success, therefore, can compensate for failure in relation to this objective of the review, which is another way of saying that the first objective of the review underpins all the others. In relation to anti-Māori racism, without due acknowledgement that such illegitimate acts have taken place, it can be difficult for the targets, and their supporters, to put down the burden. Such attitudes belong in the School’s past, and must be disposed of. This paper aims to guide the thinking of the review through (not around) that past, and towards a future in fulfilment of the review’s crucial first objective.

***Recommendation 1:***

**To support moving forward, the School could urgently invest in anti-racism and Te Tiriti o Waitangi staff training, especially for those in leadership roles.**

The next section turns to the longstanding knowledge debate about the relationship between science and Indigenous knowledge. Almost every university in the country is now teaching courses on this topic. The infamous *Listener* letter (Stewart, 2021a) has refuelled debate in the national science community about whether or not Māori knowledge, or Mātauranga Māori, can validly be considered as science. The key debate is often expressed as a yes-no question: Is Mātauranga Māori science, or not?

**Is Mātauranga Māori science? The ‘Māori Knowledge Wars’**

To frame this knowledge debate as a yes-no question is problematic, because it over-simplifies the nature of both science and Mātauranga Māori, and hence of the relationship between them. What is even more problematic is the extreme, uninformed, and politicised nature of debate that is currently taking place in some local universities. It is unconstructive to the point of unethical for scientists to use this question as a kind of ‘gotcha’ against Māori knowledge. Such unscholarly forms of discourse result from the generalised ignorance among scientists of the philosophies, not only of Māori knowledge, but also of science itself. No more convincing evidence could be found of the need for the interventions this paper calls for, than is provided by the empty attacks on Mātauranga Māori being made by some scientists, and the arrogance (and more – all the way to zealous hatred) with which such so-called ‘science guardians’ display their philosophical naivety (indicative examples: Matzke, 2022; Tallon, 2020).

In addition to not knowing much about philosophy, scientists as a group are probably more inclined than others to believe, and believe in, the triumphalist narratives science tells about itself (Falk, 2005; Ninnes & Burnett, 2001). The reality of science is rather different, and learning more about the history and philosophy of science demonstrates that science is human and hence fallible. Science is key to the meaning of ‘Western’ and ‘modern’ in relation to culture and identity, and is assumed to rule in the hierarchies of knowledge. It is relatively easy to understand why scientists often act as if science is the only knowledge worth knowing.

Such a question is like a political stick of dynamite when thrown into the public domain, such as happened following the appearance of the *Listener* letter in July 2021. To say ‘no’ becomes conflated with being anti-Māori, so saying ‘yes’ becomes the only possible answer for those who object to the way the matter was discussed by the Auckland 7 (Sowman-Lund, 2021). Perhaps the most reprehensible aspect of the actions of the letter writers was the way they reduced the space for constructive, reasoned discussion, thereby effectively ‘dumbing down’ the debate, even while patting themselves on the backs for ‘defending’ science from being ‘subverted’ by Mātauranga Māori (Stewart, 2021a).

I argue that the only honest answer to this question is ‘it depends’ on what is being meant by the constituent terms, science and Mātauranga Māori, which are both subject to semantic slippage. By this I mean that both concepts have wide coverage, and neither is transparent in meaning; neither is widely understood in its fullness. Both science and Mātauranga Māori have been subject to sustained campaigns of ideological propaganda serving political and power agendas. Below are distillations of the seven reasons or arguments found in the literature for answering yes to this question, and seven arguments for saying no (see also Stewart, 2019; Stewart, 2020).

***Reasons in support of the proposition that Mātauranga Māori is science:***

1. Traditional knowledge enabled Māori ancestors to live and flourish in harmony with the natural world in Aotearoa, employing sustainable technologies such as kūmara (sweet potato) pits and harakeke (flax) fishing nets and lines.
2. Many items of traditional Māori knowledge are based on accurate, detailed observations of macroscopic natural phenomena (plants, animals, astronomical patterns, etc.), capable of generating data of scientific validity and interest.
3. The cosmogonic Māori nature narratives work together as an overarching paradigm of knowledge, replacing in that role the science framework of theories and commitments that underpins the modern/Western worldview.
4. Māori knowledge is not necessarily restricted to the three-dimensional reality of the laws of physics and therefore may have access to wisdom that Western science has disallowed within its canon.
5. The original meaning of the word “science” comes from the Latin word meaning “knowledge” so on grounds of epistemic fairness, Māori knowledge deserves to be recognized as a form of science in its own right.

6. Māori knowledge can also be understood as a critical Māori viewpoint on science and its applications in society in Aotearoa-New Zealand – for example, as a Māori critique of scientific racism and justifications for colonizing damage done to Māori people, culture, and environments.
7. Māori knowledge sometimes seems to know more than science about very complex phenomena, such as the essential nature of a human being, or the mysteries of reality: Māori knowledge has values and metaphors that can provide fresh views on epistemology or philosophical questions of knowledge.

***Reasons against the proposition that Mātauranga Māori is science:***

1. The laws of science apply equally at all times, in all places, to all human beings; in other words, science is based on universalism (or universalist philosophical commitments).
2. Resulting from the above point, science is an acultural (or transcultural) form of knowledge, so to place a cultural modifier (such as “Māori” or “Western”) before the word science is incoherent, i.e., makes no sense.
3. Science knowledge is based on empirical experimentation and testing using well-established methodological norms (the “scientific method”), i.e., science tests itself against empirical reality.
4. Science knowledge has well-defined criteria and a vast archive of experience that ensure it adheres to the highest epistemic standards and is the “best” possible knowledge about reality available to humans.
5. Science knowledge is subject to ongoing revision as empirical knowledge advances; in other words science is “fallible knowledge” that changes over time in ways that orthodoxy or faith-based knowledge does not.
6. Scientific research is subject to the scrutiny of a community of peers, and this community ultimately decides the current status of scientific knowledge on any topic.
7. Science enabled the rapid advances in human knowledge and its applications that characterized the post-Enlightenment rise of modern European culture across all facets of human endeavour, to a previously unprecedented size, level of sophistication, and global dominance. (adapted from Stewart, 2020, pp. 12-13)

For the School adequately to address this question, it would be advisable to partner with the expertise of scholars located in other parts of AUT, including Te Ara Poutama, and other Māori units, such as Te Taupua Waiora, as well as individual Māori academics in other Schools.

**Recommendation 2:**

**To host a symposium on science and Mātauranga Māori/Indigenous Knowledge, to inform the process of re-thinking the future identity of the School.**

The remaining sections below present brief synopses of some key points that are relevant and lead towards the overall recommendations.

**Welcoming Māori and Pacific people and cultures: MAISci, Eke Tangaroa, etc**

The School is at a ‘crisis’ or crossroads in its history. Now is a unique opportunity to step into the space of leading the way towards a science practice that is open to other forms of knowledge, especially Māori and Pacific knowledge, which cannot be separated from Māori and Pacific people and cultures. The creation of a Māori Associate HoS role and the inauguration of the MAISci room, and what these initiatives stand for, are beginnings that can be built on, if the underlying issues are cogently thought through, as part of an overall plan for the future of the School.

**Equity considerations**

Whilst I have not collected the data for the School, I will assume it reflects the usual science education statistics, with clear disparities in achievement for Māori and Pacific students that are relatively stable over time, and insensitive to existing systems of support for teaching and learning. Statistical patterns of achievement in Science reflect larger disparities in macro-economics and the concentration of Māori and Pacific populations in the lower bands of family wealth at national levels, since there is ample evidence that educational success is proportional to family wealth. The longterm and large-scale events that have resulted in such societal imbalances are not amenable to small, short-term solutions within the School. Equity considerations in relation to student outcomes are related but separate from the knowledge debates discussed prior. The point is that the above recommendations for welcoming Māori and Pacific people and cultures must not be seen as equity strategies, nor as sufficient to equalise the ethnic statistics. Welcoming Māori and Pacific people and cultures to the School must become embedded in ways of working simply because it is the right thing to do. It helps in creating a doorway to learning, but is not to be confused with the work of learning itself, which requires high levels of literacy and numeracy, as well as diligence and inclination towards learning and study.

## **Māori and Pacific - from data to researchers**

The first European voyages to Aotearoa included pure science motives: to observe transits of Venus and Mercury, and to collect the flora and fauna of these lands and waterways, previously unknown by Western knowledge, that is, science. The colonial project of creating New Zealand in Aotearoa blurred the boundaries between science and ideology, truth and truth-myth, philosophy and ideology (Stewart, 2021b). Examples of racist science research continue to crop up: one recent example was the infamous ‘warrior gene’ that scientists speculated predisposed Māori to ‘criminality’ (Wensley & King, 2008).

The local sub-field of ‘Māori Education’ was inaugurated in published research in about 1970 (Ausubel, 1970; Ewing & Shallcrass, 1970). Although a strand of creative intercultural engagement has been present (Richardson, 1970; Watson, 1967), the dominant meaning of the term ‘Māori education’ has been defined by deficit (Stewart, 2014). Kaupapa Māori theory was developed following the demonstrated success of Kōhanga Reo and Kura Kaupapa Māori Māori-language pre-schools and schools, which crystallized political, cultural and linguistic aspirations. Starting in the 1980s, Kaupapa Māori education transformed the meaning of the term ‘Māori Education’—no longer defined by deficit (Hoskins & Jones, 2017). Kaupapa Māori research is research done by, with, and for Māori, in which the principles of Kaupapa Māori guide decisions at every stage, from formulation of research questions to dissemination of results (Stewart, 2017). Kaupapa Māori research thus claims to be ‘better’ research than what is considered the mainstream norm. Kaupapa Māori can be used as an adjectival phrase to mean ‘Māori-centric’—the opposite of Eurocentric. Kaupapa Māori, in this sense, means engaging as Māori with both te ao Māori (the Māori world) and te ao whānui (the wider world).

## **Māori and Pacific knowledge as mirrors for science: Towards better science**

To see Māori and Pacific forms of knowledge as different from science at the level of their underlying philosophies is to point towards the potential of these Indigenous knowledges to hold up a mirror to science, which allows science more clearly to see its own limitations and errors. I argue that this is the best way for the gifts and wisdom of Indigenous knowledges to inform science – by recognising and learning from their differences, as well as their similarities. The full extent of the mischief done by the *Listener* letter starts to become clear. To sensationalise the question of whether or not Mātauranga Māori is science shuts down what

would otherwise be an extremely productive debate and an educational opportunity for the nation and its science system.

In my doctoral thesis, I posited ‘Kaupapa Māori science’ as a more robust alternative to ‘Māori science’ (Stewart, 2007). I delineate Kaupapa Māori science as a critical form of science, informed by local Indigenous identities and ethics as a standpoint for critique. I critique science as an act of love for science—an idea I call ‘aroha as critique’ (Stewart, 2022). Science has undeniably been used to advance racist social agendas that still today exert influence on the thinking of Māori and Pākehā, scientists and non-scientists alike. My intention in advancing Kaupapa Māori science is to hold science to its own criteria and expose its blind spots. Science is racist (Marks, 2017) and sexist (Gaston, 2015), and scientists are as vulnerable as anyone else to corruption (Proctor, 2012).

***Recommendation 3:***

**To develop a taught course on the relationship between science and Mātauranga Māori/Indigenous Knowledge.**

**Te Kura Mātai Taiao - School of Environmental Sciences**

The current Māori name of the School of Science is ‘Te Kura Pūtaiao’ – but the identity of the School could move towards ‘Environmental Sciences’ – which in te reo Māori is ‘Mātai Taiao’ (as distinct from ‘Pūtaiao’ which is taken as equivalent to ‘Science’). The contextual modifier ‘Environmental’ aligns with the domains of most interest of Mātauranga Māori. A move towards a bilingual, bicultural identity as Te Kura Mātai Taiao-School of Environmental Sciences aligns with much of the current research in the School, and allows the pursuit of a local indigenous Māori and Pacific flavour and sensibility in future teaching and research programmes.

***Recommendation 4:***

**That the future identity of the School be signalled by a change of name to Te Kura Mātai Taiao-School of Environmental Sciences.**

**Conclusion**

I have briefly outlined the theoretical and educational issues involved in thinking with Te Tiriti o Waitangi about the current review of the School of Science. To move towards a School

informed by Te Tiriti, it will be necessary to continue and expand the initiatives that have already started, but it is important to be guided by clear analyses of the related but distinct issues involved. There are two Māori and Pacific equity issues: one concerns student achievement rates, and the other is about rebalancing the representation of Māori and Pacific people, cultures, languages, identities and knowledges in all the School's activities. Four recommendations fall out of the discussions presented above:

1. Investing in anti-racism and Te Tiriti o Waitangi staff training;
2. Hosting a symposium on science and Māori/indigenous knowledge;
3. Developing a taught course on the relationship between science and indigenous knowledge;
4. Changing the School's name to Te Kura Mātai Taiao-School of Environmental Sciences.

Change is never easy, and real learning always involves significant change and challenge. It is difficult to give up privilege and to share power when we have become accustomed to them. The envisaged changes outlined in this paper may not be achievable in this review, but this does not mean it is any less important to consider where we might go, if we had enough courage.

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