




The 51st reason why there are so few Māori in science

Georgina Tuari Stewart 

Te Ara Poutama, Auckland University of Technology, New Zealand

Photo by Ousa Chea on Unsplash

ABSTRACT

A 2022 paper by Tara McAllister lists '50 reasons why there are no Māori' in university science departments, giving a range of examples of Māori experience of personal and structural racism within the edifices of science and research in Aotearoa New Zealand. In support of McAllister and the larger social and intellectual project of Kaupapa Māori to which her work contributes, this commentary offers ethnic socio-economic inequality as the '51st reason' and explains how it causes the permanent disparity of very few working scientists who identify as Māori.

KEYWORDS

Māori scientists; school science; science education; socio-economic inequality

Introduction

A recent paper by Tara McAllister (2022), written with passion and an arresting title, lists 50 reasons why there are 'no Māori' in university science departments. The list gives examples of how Māori experience personal and structural racism in the edifices of science and research in Aotearoa New Zealand. McAllister sketches the context into which she is writing, when the decades-old debate about the relationship between science and Mātauranga Māori (Lomax, 1996; McKinley, 1996) has been stirred up afresh by the infamous 2021 *Listener* letter (Clements et al., 2021). In that letter, seven senior professors from the University of Auckland warned that Mātauranga Māori was trying to damage science.

The *Listener* letter generated rapid responses including condemnation, critique, and support for Mātauranga Māori, in media and research literature (Freshwater, 2021; Ngata, 2021; Sowman-Lund, 2021; Stewart, 2021; Waitoki, 2022) and complaints to the Royal Society Te Apārangi about the letter's authors who were members, alleging they had breached academic ethics. (Those complaints were ultimately dismissed as beyond the remit of the society to investigate.) It is clear from the ongoing production of responses, including McAllister (2022), that the *Listener* letter may continue to generate after-shocks for some time to come (see also Stewart, 2022).

In support of the underlying aims of McAllister's work in this and other papers, and the social and intellectual project of Kaupapa Māori (Hoskins & Jones, 2017) to which that work contributes, here I suggest an underlying reason, namely socio-economic inequality, to explain why there are so few working scientists who identify as Māori. Below, I briefly sketch the chain of links between national ethnic socio-economic inequities, whereby Māori families are concentrated in the lowest

income bands, and have been since records began, and the permanent lack of Māori scientists across the universities and research institutes of our national science sector. Science education is the key connector between these two social phenomena.

Science education and the lack of Māori scientists

By ‘science education’ I am referring to formal programmes of teaching and learning directed towards the knowledge base and objects of study of science. Science education is a fraught space and a hot button topic. Periodically, national science experts turn their attention to science education and its role in the national science system. One such was Peter Gluckman, former Chief Science Advisor to the New Zealand government (2009 – 2018), who oversaw a major report on science education (Gluckman, 2011). In directing his attention and resources towards producing this substantial piece of work, Gluckman showed that he appreciated the importance of science education as the primary engine for producing future New Zealand scientists, but the published report demonstrates that he (like so many others) misconceived the nature of the problem. There is a long history of blaming others in these contexts: university science departments, for example, often blame the poor results of their Māori students on the failures of secondary school science. All this kind of reasoning misses the point, however, as explained below.

School science education is fundamental to the development of future scientists. Education necessarily takes different forms according to the age of the students; in schools, primary science and secondary science are quite different, and have little crossover with each other, or the adjacent sectors, early childhood and tertiary. Primary science is often neglected in the classroom in favour of literacy and numeracy. Secondary science is further divided into junior and senior curricula, and influenced by tertiary science education. The needs of the minority of students who intend to study science post-school dictate the nature of secondary science, at the expense of the majority of secondary students, who drop science as soon as they can, citing boring content and too much writing as the dominant reasons. Almost all Māori students part ways with science education at this point.

‘School science’ is a term used to refer to the simplistic versions of science knowledge that are taught in schools (Aikenhead, 2000; Duschl, 1990). Studies of school science include philosophical dimensions such as the images of science portrayed in curriculum materials such as textbooks (Ninnes & Burnett, 2001). Studies of science textbooks show how they portray an ideological image of science that is triumphalist, male-dominated, and European in origin. It seems plausible that such images are implicitly alienating to girls and Māori students, even if the affected students cannot put those (subtle, psychological) effects into words (Stewart, 2017).

At statistical levels, school success has been reliably established to be directly proportional to family income, and Māori families are concentrated in the lowest income brackets. Māori educational inequity, therefore, is largely explained by ethnic socio-economic disparities. Within the overall ethnic disparity in school achievement, science is the worst-case scenario for Māori students. According to national statistics last published openly in about 2010, only around 5% of Māori boys stay at school until the end of Year 13 anyway, and of the small number that are still in school in Year 13, almost none are taking science subjects. The statistics are not quite so dire for Māori girls, but the patterns are the same—across the national Māori cohort entering school at age 5, only a small percentage achieve Year 13 qualifications, and very few of those include science subjects.

Of all the subjects in the compulsory school curriculum, science has the most exacting academic demands; it requires high levels of literacy and numeracy, and a high tolerance for needing to rote-learn new vocabulary, and study large amounts of written material, on topics selected by the teacher. Secondary science classroom teaching practice is dominated by copying off the board, justified by the content-heavy nature of the subject, and teachers’ anxiety to ‘cover the curriculum.’ For these reasons, senior secondary science subjects act as proxies for high

academic achievement. Students who succeed in senior secondary science subjects must be resilient enough to cope with these demands. They need good study habits, and the support of a home that is well-organised and provides for their needs, including a quiet space to study undisturbed. These are the kinds of everyday details that translate at statistical levels to the social fact that success at school, and in school science education in particular, is directly proportional to family income.

What has been tried to ameliorate the situation?

Over the years, many projects and initiatives to address the lack of Māori in science have been actioned by schools, universities, scientific and philanthropic organisations (McKinley, 2008; Rikihana, 1982). In 2022, almost every university in Aotearoa New Zealand has invested in one or other of these initiatives (AUT, 2022; Massey University, 2022; Otago University, 2022). These many and varied attempts to increase Māori representation in science have invariably been sincere and well-intentioned, but have typically been limited by one or more of the following factors: being very small and localised; depending on short-term funding, or on one 'hero' teacher; expecting short-term measurable results; or lacking understanding of the problem in all its dimensions (Hanly, 2009; McKinley et al., 2004).

Many such initiatives have had a 'missionary' flavour, propounding ideas such as that Māori students 'need to realise how important' science is. Others have focused on a 'fun and excitement' approach to science, or on the need to build peer support networks. Cultural dimensions have been included to overcome the monoculturalism of traditional science education, such as holding science camps at marae (Hodson, 1993; Northern Advocate, 2022; Stewart, 2020a). The problem is that such ideas ignore the real, grinding, lifelong problems that cause the attrition of Māori students from school, and, even for those who remain in school, from studying science at school. After a while, the propensity of such initiatives to ignore the socio-economic realities that underlie this problem begins to seem, in itself, like a form of racist White ignorance (Mills, 2008). It is easier, apparently, for these initiatives to adopt a White Saviour approach, which views 'Māori' as needing their help to receive the benefits of science education, than to face up to what is really going on in our society (Stewart, 2020b).

The Starpath Project (University of Auckland, 2017) was one such large-scale initiative, funded by the New Zealand government, and hosted at the University of Auckland, designed to overcome the 'choke points' for Māori going on from school to study science at university in Aotearoa New Zealand. The project revealed how few Māori teenagers were studying science at secondary school to be able to go on to study science at university. The choke point was not between secondary and tertiary science education, but between junior and senior secondary, and the roots of this choke point spread widely, far beyond schools and classroom teaching and learning.

Starpath highlighted the need for secondary schools to build alliances with Māori parents, which were non-existent due to intergenerational histories of negative Māori experiences at school. For Māori families lacking role models or histories of academic success, schools needed to make more effort to engage parents in their children's education. Specific measures that were found to work included supporting Māori parents to attend parent-teacher interviews by providing letters to employers, parking, food and childminding.

Conclusion

To focus on encouraging Māori parents to attend teacher-parent interviews and support their secondary school-aged children to stay at school and keep studying science is a long way from the 'heroic' interventions it seems most people would prefer to hear about. A school holiday science

camp at a marae with quotes from excited children is more newsworthy (Mackay et al., 2020; Northern Advocate, 2022).

Socio-economic ethnic inequity explains the lack of Māori in science because, in order to become a scientist, a person first needs to graduate with a bachelor's degree in science, and to enrol in a science degree, a person needs to have achieved exit-year level school qualifications in science subjects. But there are very few Māori students in Year 13 science classes, anywhere in the country. The lack of Māori studying science at university, therefore, is explained by the ethnic inequity, whereby the families of Māori children are concentrated in the lowest wealth and income brackets. And the result of the lack of Māori studying science at university is the scarcity of Māori scientists working in university science departments and other science research contexts.

Disclosure statement

There are no conflicts of interest to declare. This work was not supported by any funders. No data sets are associated with this work.

Notes on contributor

Georgina Tuari Stewart (ko Whakarārā te maunga, ko Matauri te moana, ko Te Tāpui te marae, ko Ngāpuhinui-tonu te iwi) is Professor of Māori Philosophy of Education in Te Ara Poutama, Auckland University of Technology, Auckland, Aotearoa New Zealand, and has been teaching and researching Māori science education for 30 years.

ORCID

Georgina Tuari Stewart  <https://orcid.org/0000-0001-8832-2415>

References

- Aikenhead, G. (2000). Renegotiating the culture of school science. In R. Millar, J. Leach, & J. Osborne (Eds.), *Improving Science Education - the contribution of research* (pp. 245-264). Open University Press.
- AUT. (2022). *First AUT STEM Camp a success*. <https://news.aut.ac.nz/around-aut-news/first-aut-stem-camp-a-success>
- Clements, K., Cooper, G., Corballis, M., Elliffe, D., Nola, R., Rata, E., & Werry, J. (2021). In defence of science. *New Zealand Listener*, 4.
- Duschl, R. A. (1990). *Restructuring school science: The importance of theories and their development*. Teachers College Press.
- Freshwater, D. (2021). *Vice-Chancellor comments*. <https://www.auckland.ac.nz/en/news/2021/07/26/vice-chancellor-comments.html>
- Gluckman, P. (2011). *Looking ahead: Science education for the twenty-first century. A report from the Prime Minister's Chief Science Advisor*. <http://www.pmcsa.org.nz/wp-content/uploads/Looking-ahead-Science-education-for-the-twenty-first-century.pdf>
- Hanly, T. (2009, September 21). Making the most of science: Science and te ao Māori. *NZ Education Gazette*, 88(17), 6-7.
- Hodson, D. (1993). In search of a rationale for multicultural science education. *Science Education*, 77, 685-711.
- Hoskins, T. K., & Jones, A. (Eds.). (2017). *Critical conversations in Kaupapa Māori*. Huia Publishers.
- Lomax, T. (1996, July). Māori science revisited. *NZ Science Monthly*, 7(6), 12-13. <http://nzsm.webcentre.co.nz/article544.htm>
- Mackay, S. M., Tan, E. W., & Warren, D. S. (2020, June 12). Developing a new generation of scientist communicators through effective public outreach. *Communications Chemistry*, 3(1), 76. <https://doi.org/10.1038/s42004-020-0315-0>
- Massey University. (2022). *Pūhoro STEM*. <https://www.puhoro.org.nz/>

- McAllister, T. (2022). 50 reasons why there are no Māori in your science department. *Journal of Global Indigeneity*, 6(2), 1-10. <https://www.journalofglobalindigeneity.com/article/55788-50-reasons-why-there-are-no-maori-in-your-science-department>
- McKinley, E. (1996). Towards an indigenous science curriculum. *Research in Science Education*, 26(2), 155-167.
- McKinley, E. (2008). Māori in Science and Mathematics Education. In J. S. Te Rito & S. M. Healy (Eds.), *Te Ara Pūtaiao: Māori insights in science* (pp. 27-36). Ngā Pae o te Māramatanga. <http://www.maramatanga.ac.nz/sites/default/files/TO%20Te%20Ara%20P%C5%ABtaiao%20Maori%20scientists.pdf>
- McKinley, E., Stewart, G., & Richards, P. (2004). Māori students in science and mathematics: Junior programmes in secondary schools. *Set: Research for teachers*, 2004(3), 9-13.
- Mills, C. W. (2008). White ignorance. In R. Proctor & L. L. Schiebinger (Eds.), *Agnology: The making and unmaking of ignorance* (pp. 230-249). Stanford University Press.
- Ngata, T. (2021). *Defence of colonial racism*. <https://tinangata.com/2021/07/25/defending-colonial-racism/>
- Ninnes, P., & Burnett, G. (2001). Postcolonial theory and science education: Textbooks, curriculum and cultural diversity in Aotearoa New Zealand. *New Zealand Journal of Educational Studies*, 36(1), 25-37.
- Northern Advocate. (2022). *Hands-on science camp at marae thrills Te Hiku tamariki*. <https://www.pressreader.com/new-zealand/the-northern-advocate/20220903/281539409779443>
- Otago University. (2022). *Science Academy*. <https://www.otago.ac.nz/ouassa/index.html>
- Rikihana, T. (1982). *Pūtaiao - Te Ao Tūroa*. Kohia Teachers Centre, Auckland College of Education. <https://komako.org.nz/person/920#13990>
- Sowman-Lund, S. (2021). *Letter on mātauranga Māori and science attracts more than 2000 signatories*. <https://thespinoff.co.nz/politics/30-07-2021/live-updates-july-30-pay-talks-resume-as-nurses-reject-latest-offer/>
- Stewart, G. (2017). A Māori crisis in science education? *New Zealand Journal of Teachers' Work*, 14(1), 21-39. <https://doi.org/10.24135/teacherswork.v14i1.101>
- Stewart, G. T. (2020a). Māori Science Curriculum. In M. M. Atwater (Ed.), *International handbook of research on multicultural science education* (pp. 1-23). Springer International Publishing. https://doi.org/10.1007/978-3-030-37743-4_33-1
- Stewart, G. T. (2020b). A typology of Pākehā "Whiteness" in education. *Review of Education, Pedagogy, and Cultural Studies*, 42(4), 296-310. <https://doi.org/10.1080/10714413.2020.1773177>
- Stewart, G. T. (2021). Defending science from what? *Educational Philosophy and Theory*, 1-5. <https://doi.org/10.1080/00131857.2021.1966415>
- Stewart, G. T. (2022). Whiteness masquerading as academic freedom. In R. Watermeyer, R. Raaper, & M. Olssen (Eds.), *Handbook on academic freedom* (pp. 177-189). Edward Elgar. <https://www.e-elgar.com/shop/gbp/handbook-on-academic-freedom-9781788975902.html>
- University of Auckland. (2017). *Starpath Project*. <https://www.auckland.ac.nz/en/education/research/research-networks-and-groups/starpath-project.html>
- Waitoki, W. (2022). In defence of mātauranga Māori: A response to the 'seven academics'. *The New Zealand Medical Journal (Online)*, 135(1552), 139-142.