

RESEARCH/PRACTICE ARTICLES

Ngā Waihotanga Iho: Self-determination through Indigenous environmental education in New Zealand

Giles Dodson^{1,*}  and Mikaera Miru²

¹College of Humanities and Social Sciences, Massey University, Auckland, New Zealand and ²Te Uri O Hau Settlement Trust, Whāngarei, New Zealand

*Corresponding author. Email: g.dodson@massey.ac.nz

(Received 02 March 2020; revised 11 May 2021; accepted 12 May 2021; first published online 13 July 2021)

Abstract

This paper discusses the use of an estuary monitoring toolkit *Ngā Waihotanga Iho* as a central part of a Māori-centred education project undertaken by Kaipara hapū (sub-tribe), Te Uri O Hau, in Northland, New Zealand. The toolkit was designed by New Zealand's National Institute for Water and Atmospheric Research (NIWA). In this project, Te Uri O Hau collaborated with NIWA and regional high schools in order to use this toolkit as a mechanism for kaitiakitanga (environmental guardianship) and Indigenous-led environmental education. This paper demonstrates that approaches such as this can be powerful vehicles for Indigenous self-determination as Māori actively undertake tribal development and environmental guardianship, and strengthen the place of Indigenous knowledge, priorities and approaches within an evolving 'post-colonial' education system.

Keywords: environmental education; Indigenous knowledge; self-determination; partnership; community; science

Whakataki: Introduction

In New Zealand, there is considerable emphasis placed on Māori education success. Meaningful, sustained relationships between schools and communities, especially Māori communities, is held to be central to achieving this (Ministry of Education, 2020). Legacies of colonialism and a state education system that has neglected Māori needs, and which has seldom recognised or legitimated Māori cultural preferences and knowledges (Walker, 2016), are, overtime, being addressed as decolonising thinking penetrates the New Zealand education system (Berryman, 2013; Lee-Morgan, 2016; Penetito, 2010; Smith, 2017). Māori approaches to decolonisation (in education and elsewhere) emphasise te tino rangatiratanga, or Māori self-determination, as a primary value and goal, in which Māori culture and language, values and institutions are centred, and in which Māori are in control of Māori concerns. This paper presents the implementation of the *Ngā Waihotanga Iho* estuary monitoring toolkit through a collaboration between the hapū (Māori sub-tribe) Te Uri O Hau and secondary schools in the Kaipara district of New Zealand's Northland region, illustrating how environmental education of this kind can be a vehicle for Māori self-determination. The project demonstrates this toolkit as a means to advance Indigenous environmental guardianship in the region, to engage young New Zealanders in Indigenous environmental monitoring concepts and practices and to build constructive relationships between Māori communities and mainstream schools.

Ngā Waihotanga Iho translates as, *that which has been left to us, we should take care of*, and the name captures the Māori ethic of sustainable resource use and management and maintaining relationships with key environments, in this case, culturally valued estuaries. The paper suggests that

tools such as *Ngā Waihotanga Iho*, which foreground Indigenous values alongside environmental science methods, can enhance the place of Indigenous knowledge in environmental education. The implementation of the toolkit described here shows how Indigenous knowledge can be elevated alongside scientific methods in understanding and teaching about the environment, rather than being subsumed or submerged within mainstream pedagogy or curriculum. The uses of tools such as this can support long-term socio-cultural and community development. In New Zealand, a central decolonising project is the re-normalisation of the Māori language and the ideas it contains, across all academic, scientific and educational fields. In keeping with this ethic, this paper seeks to illustrate the use of Indigenous concepts in the context of its discussion. Consequently, this paper uses key Māori concepts throughout in presenting this discussion; an English translation is provided in parentheses.

As part of the *Ngā Waihotanga Iho: marae environmental science* project, in 2016/2017, 286 local high school students attended 1 of 11 one-day environmental monitoring wānanga (workshops, based on Māori principles of teaching and learning) held at two Te Uri O Hau marae (ancestral centres of Māori social, cultural and political life; multifunction Indigenous community institutions). These marae provide direct access to the estuaries of the Kaipara Harbour, New Zealand's largest estuarine ecosystem. The wānanga provided local high school students with a highly practical, hands-on experience of gathering environmental observations and data from the harbour waterways, in tribally significant locations and led by Te Uri O Hau kaitiaki or tribal environmental guardians. Traditional protocols and instruction from project kaiarahi (leader) and kaitiaki contextualised these learning experiences, providing the school students (and teachers) with a rich experience that connected scientific estuary monitoring with Māori epistemology, spiritual thought and practice, and with contemporary tribal concerns for environmental degradation. These wānanga (workshops), and additional training that kaitiaki (guardians) undertook alongside specialist National Institute for Water and Atmospheric Research (NIWA) Māori environmental scientists, deepened the capacity of Te Uri O Hau to undertake environmental monitoring and collect local environmental data and to engage local school students. As such, the project demonstrated the viability of using environmental education based on Indigenous values and practices as a means to realise, in part, interrelated tribal aspirations for environmental guardianship of the Kaipara Harbour, and tribal social and cultural development. The value of building and sustaining relationships with local schools and regional young people in service of these aspirations was also demonstrated.

Background: te kaitiakitanga o te mana whenua

Te Uri O Hau are mana whenua and mana moana (holding traditional authority over land and sea) over the northern Kaipara region and Kaipara Harbour. In the period following Te Uri O Hau's settlement of historic Treaty of Waitangi grievances with the Crown¹, significant energy and resource has been devoted by the TUOH Settlement Trust and subsidiary organisations, and by tribal members, into developing a strategic approach to kaitiakitanga (environmental guardianship) and to strengthening the role of marae (ancestral community complex) within this work (Te Uri O Hau 2011). Kaitiakitanga, following Marsden (2003), can be understood as encompassing the traditions and practices of Māori environmental conservation, protection and sustainable management. Te Uri O Hau have a vision of devolved kaitiakitanga responsibilities and activities at each of their marae, networked into an overall region-wide approach. Te Uri O Hau kaitiaki (guardians) are tribal members empowered and given traditional authority to lead this work.

For many years, tribal members have been concerned at the ongoing degradation of the Kaipara Harbour and its waterways. This concern has spurred several initiatives, including the tribal strategy and the establishment and co-leadership of a multi-stakeholder catchment

management partnership, the Integrated Kaipara Harbour Management Group (IKHMG, 2011; Makey & Awatere, 2018). The formation of an active and skilled core of tribal members able to represent each of their marae and able to serve as kaitiaki is central to the strategy, which is itself located within a larger tribal strategy for broad-based social, economic and cultural development. As part of this work, Te Uri O Hau maintain close relationships with related tribal groups, and regional and national environmental governance, policy, regulatory and research organisations (IKHMG, 2011).

The *Nga Waihotanga Iho* project formed one strand of this work. Sharing Te Uri O Hau values, practices and aspirations with the wider community and with the next generation of the Kaipara region deepens and extends the commitment to kaitiakitanga and tribal development. Te Uri O Hau educational kaitiakitanga has twin goals in this regard: firstly to build good quality relationships with local schools and promote engagement by schools with cultural knowledge and practices. Secondly, it aims to equip regional young people with knowledge and appreciation of their environment based on Indigenous values and to raise their awareness of environmental issues faced by the Kaipara Harbour. In all of this work, Te Uri O Hau marae, taonga tuku iho (cultural knowledge and practices handed down from one generation to the next) and self-determination are central.

Marae, Education and Indigenous Knowledge

Adds, Hall, Higgins, and Higgins, and (2011, 524) observe that ‘in the context of post-colonial New Zealand, marae have become one of the last bastions of Māori culture in which tikanga Māori [Māori practices] ways of doing things prevails’. But, marae are not merely places where Māori culture is evident. They are complex, multifunction institutions, within which Māori knowledge and thought is embedded and where cultural, ancestral resources, such as knowledge, history and language, are available and transmitted according to Māori norms, priorities and values. Marae are central institutions of Māori cultural reproduction and sites of cultural, social and political focus for Māori communities. Among the numerous practical, social and cultural functions, marae are centres of cultural learning and transmission and provide both physical and spiritual entranceways into te ao Māori, the Māori world. It is at marae that culturally preferred modes of interaction and engagement, such as ako (reciprocal learning) and wānanga (group-based discussion and learning) are given full expression (Adds et al., 2011). The fluidity and dynamism of these learning experiences results from the interrelationship of natural, spiritual and physical worlds present at marae (Lambert, 2009; Mlcek, et al., 2009). Revitalising, strengthening and developing marae as cultural institutions is a central part of Māori efforts to revitalise language and cultural traditions.

Te tino rangatiratanga – ‘Māori control over things Māori’ (Pihama, Cram, & Walker, Cram, & Walker, 2002, 36) – is at the centre of kaupapa Māori projects and the process of decolonisation. Kaupapa Māori are projects that advance te tino rangatiratanga (among other values) and occur in any conceivable field of social action. Education has been a key site of critical analysis and transformational effort (Smith, 2017). Conventionally, te tino rangatiratanga has come to mean Māori self-determination, and Māori control over Māori things, such as social and cultural development (Hoskins, 2017; Smith, 2017). The term also has constitutional implications, being guaranteed to Māori by Article 2 of Te Tiriti O Waitangi (Treaty of Waitangi). In this context, tino rangatiratanga is often translated as ‘paramount authority’ (Mutu, 2010a, 29) or ‘independence and full chiefly authority’ (Waitangi Tribunal, 2014, 528). Tangihaere and Twiname (2011, 107) note that tino rangatiratanga is manifest ‘conceptually, politically, and in the visible structures, such as marae, which display in their construction, decoration, and protocol the commitment to values of te ao Māori’. Yet, while self-determination is a fundamental value, many Māori communities still face crises of various forms, undermining capacities to uphold te tino rangatiratanga in meaningful ways, such as through transmitting ancestral knowledge and learning. Kawharu (2014)

speaks of a contemporary twin crisis in Māori communities – te reo Māori (the Māori language) and marae in decline, particularly in rural areas such as Northland, where migration to urban centres and socio-economic deprivation can undermine cultural resilience and therefore the capacity for self-determination.

Although marae are bastions of tradition, marae practices have evolved over time too as Māori have responded to changing socio-cultural circumstances and the various and wide-ranging impacts of colonisation. Moves towards ‘biculturalism’ on the part of the Crown (and a shift away from paternalistic Crown-Māori relations) have increased cultural awareness and normalised (to a degree) the place of Māori culture within public institutional practices, including schools and many other areas of the public sector. As Panapa (2015) suggests, this cultural awareness and normalisation is a feature of ‘liberal biculturalism’, in which State and mainstream practices accommodate Māori culture and language, often in ceremonial or, arguably, superficial ways. However, a ‘critical biculturalism’ is necessary to move beyond liberal tolerance and accommodation, and towards a biculturalism that directly addresses Māori-settler relationships, which recognises and upholds the centrality of Māori knowledge in public life that actively protects and enhances Māori language and culture, and which addresses issues of structural power relations and inequalities (Panapa, 2015). Indeed, the adaptation of culture for ‘non-traditional purposes’ (e.g. state agencies, schools, business organisations incorporating Māori cultural practices) increases ‘the risk of neo-colonisation’ (Tangihaere & Twiname, 2011, 108). Clearly, in the educational context, the place of marae, of Māori values and priorities and educational philosophies must be activated to strengthen or make critical (Panapa, 2015), our contemporary biculturalism, and to contribute to a sustained reclamation of te tino rangatiratanga through Treaty of Waitangi-based partnership.

In mainstream schools, in which most Māori students are enrolled, community relationships are held to be critical to Māori educational success (Hotere-Barnes, Bright, & Hutchings, 2014). Hotere-Barnes, Bright, and Hutchings (2014) provide guidelines for mainstream educators to explicitly support te reo Māori and Māori knowledge and preferences in learning processes. These guidelines emphasise the importance of partnerships between the education system and others in the community committed to the thriving of Māori ways of being in the world (this emphasis is increasingly visible with education policy; however, implementation can be uncertain, see Ministry of Education, 2020). Schools need to ensure strong connections with the local communities because they contain untapped resources, such as marae and other community assets, such as people and groups possessing historical, environmental and cultural knowledge.

From these points of view, a liberating, rather than domesticating, learning process requires communities to acknowledge and address colonisation and its lingering effects. The process of learning ‘cannot successfully be imposed from above or subjected to compliance with bureaucratic guidance’ (Bowl, 2011; 92). Rather, the collective self-determination of te tino rangatiratanga cannot be realised unless Māori have the capacity to be politically and culturally self-determining, that is, with respect to education, they are able to determine the nature of partnerships entered into and can ensure the intended outcomes of partnership are realised. As Munford and Walsh-Tapiata (2006, 438) point out (in the context of community development work in bicultural contexts), ‘social change requires that people believe they can have agency and can achieve change . . . how self-determination is played out is strongly connected to how communities come to recognise their ability to effect change’.

One field in which significant development has occurred is in the integration of Māori knowledge and western science to address pressing environmental issues. In recent years, ‘partnership’ has become a central concept within New Zealand environmental science and management practices, and productive cross-cultural engagements and initiatives now feature across the gamut of social and environmental contexts. These include exploring the rights and responsibilities of kaitiakitanga (environmental guardianship) (Kawharu, 2000; Mutu, 2010b), assessments of traditional food resources (Moller, et al., 2009), management of wet lands (Forster, 2010), the

protection of Māori heritage assets (Kawharu, 2000), river/freshwater health (Harmsworth, Awatere, & Robb, Awatere, & Robb, 2016; Tipa, 2010) and landscape-scale environmental management (IKHMG, 2011). Structurally, resource management legislation requires local and regional governments to engage with mana whenua (recognised traditional authority holders) with respect to natural resources and environmental management (see, Resource Management Act, 1991, S. 58M). Recent Treaty of Waitangi settlements have produced innovative legal frameworks and co-governance arrangements relating to rivers, a former national park and other areas of national, regional and local significance and in which Māori perspectives are central to decision making (see, for instance, Te Awa Tupua Whanganui Claims Settlement Act, 2017; Te Urewera Act, 2014; Waikato_Tainui Raupatu Claims Waikato River Settlement Act, 2010). Te Uri O Hau provides significant leadership in relation to resource management, using the re-established treaty-relationship to convene and lead a landscape scale multi-stakeholder partnership, the Integrated Kaipara Harbour Management Group, which is focused on integrating Māori knowledge, science and decision-making to ensure the health and productivity of Kaipara harbour and its catchment (Hepi et al., 2018; IKHMG, 2011; Makey & Awatere, 2018).

The *Ngā Waihotanga Iho* project is located in this context and seen in light of the leadership of Te Uri O Hau in asserting its rights to be fully involved in setting the agenda for understanding and mitigating environmental pressures within its region and in presenting creative and constructive ideas to achieve these goals. Te Uri O Hau are determined to both deepen the capacity of their marae to uphold kaitiakitanga (environmental guardianship) and to serve as cultural repositories and as dynamic, adaptive institutions where collaborative and partnership approaches to education are enacted.

Ngā Waihotanga Iho: NIWA Estuary Monitoring Toolkit

The Nga Waihotanga Iho Estuary Monitoring Toolkit has been developed by New Zealand's National Institute of Water and Atmospheric Sciences (NIWA) over several years and has been designed specifically for use by Māori (Swales et al., 2011). *Ngā Waihotanga Iho* is a module-based toolkit combining accessible science-based tools of environmental measurement and observation with Māori values. The toolkit reflects Māori perspectives and values in relation to waterways (and especially in relation to sustainable use of estuaries) and integrates these with environmental and ecological values. The toolkit is published in both English and te reo Māori (the Māori language). Initially, as the production of the toolkit neared completion, NIWA and Te Uri O Hau, along with other stakeholders, participated in a testing 'roll out' of the toolkit (NIWA, n.d.) at Te Uri O Hau marae in 2012 and 2013. At this time, the *Ngā Waihotanga Iho* tools were shown to be viable for both empowering Te Uri O Hau kaitiaki (guardians) and for engaging local school students in environmental monitoring. In 2016, this work was further developed, and the current project was conceptualised. At this time, the decision was made by the Te Uri O Hau project leader to focus the *Ngā Waihotanga Iho* work on two marae (ancestral community complexes), Ōruawharo and Ōtamatea, given their proximity both to the Kaipara harbour and to local high schools (Rodney College and Ōtamatea High School) which had indicated their interest in participating in the initiative.

Ngā Waihotanga Iho marae environmental science project

The *Ngā Waihotanga Iho marae environmental science* project commenced in October 2016 and was completed in April 2017 and consisted of three phases. Firstly, initial planning, relationship development and coordination between project participants, including the authors. Secondly, a two-day NIWA-led kaitiaki (guardian) training wānanga (workshop) held at Ōtamatea marae (ancestral community complex). Thirdly, the project implementation phase consisting of 11 one-day environmental science wānanga held between both Ōtamatea and Ōruawharo marae

between late November 2016 and April 2017. In total, 10 kaitiaki, alongside NIWA scientists who delivered the training sessions, and 286 secondary school students from Ōtamatea High School (Ōtamatea) and Rodney College (Ōruawharo) participated in the *Ngā Waihotanga Iho* project. The primary author of this paper was a project collaborator and coordinator, working alongside the Te Uri O Hau project leader. The data and findings presented below result from three data creation methods: firstly, the participant-observation data generated by the primary author while present at each of the one-day wānanga, including informal conversations with all project participants and debrief discussions with kaitiaki. Secondly, through a post-event reflective interview with the project leader; and lastly, through brief student questionnaires completed at the conclusion of each day-long experience. These student data are not intended to provide a detailed evaluation of the project but rather provide brief insight into overall student experience. Basic demographic information was collected, as required by the project's funding agreement (see declaration at the end of paper). These data are necessarily limited; however, they are sufficient for the purposes of the argument presented here².

Training Wānanga

Prior to implementation, a training wānanga was held at Ōtamatea marae, in order to familiarise the kaitiaki with the toolkit. This training was led by two NIWA scientists from Te Kūwaha, NIWA's Māori environmental science research group. The wānanga (workshop) focused on clarifying the preliminary considerations regarding the implementation of the toolkit, such as selecting appropriate sites for estuary monitoring and 'ground truthing' information available on likely sites gotten from aerial photographs, planning and research documents and nautical charts. As the kaitiaki possess intimate first-hand knowledge of environs at both Ōtamatea and Ōruawharo marae, the selection of appropriate monitoring sites was straightforward. At this time, the selection of toolkit modules for implementation was made. The Habitat Mapping, Sedimentation and Plant Survey modules were selected based on the relevance of these modules to tribal concerns and the practicalities of delivering module-based activities in the course of a one-day student experience. The remainder of the time was spent in the field, establishing monitoring transects, becoming familiar with the activities of each of the modules and developing the approaches necessary to deliver each of these modules as a hands-on student learning experience within a set time frame.

Marae-science estuary monitoring wānanga

The marae-science wānanga commenced in November 2016 and continued until the end of the 2016 school year. Additional wānanga were held in March 2017. As the project involved local year 9 and 10 (13–14 years old) high school students spending a full day at an estuary, engaged in monitoring activities, the project work was intentionally restricted to the summer months.

Each wānanga followed a set format. In the morning, kaitiaki assembled at either Ōruawharo or Ōtamatea marae and made preparations for the arrival of the school party. The school party arrived by bus and waited to be called on to the marae through the pōhiri, the traditional Māori protocols of welcome and engagement. This included the kaitiaki issuing a call of welcome with pūtātara, pūkāea (Māori instruments) and karanga (the welcome call during pōhiri). The pōhiri followed the tikanga (protocols) of Te Uri O Hau marae, including mihimihi (formal greetings) on both sides and an opportunity for the visiting teaching staff to acknowledge their welcome.

The project leader then provided the visiting group with a kōrero mana whenua (an overview of tribal and marae history, including environmental knowledge and values in relation to the harbour) and an rationale for the project and for the invitation to young people to come to their marae to engage in environmental monitoring.

At the conclusion of the formalities, kaitiaki gathered the students together for further informal whakawhanaungatanga (the process of establishing relationships) and student groups were allocated to kaitiaki. Depending on numbers, student groups were 5–6 students each, with 1 supervising kaitiaki. Teachers and other project team members (the author and other research staff) then supported the kaitiaki to engage and supervise their student groups. Groups then left the marae to access the monitoring sites.

The general format of the monitoring wānanga provided the opportunity for students to experience all three practical monitoring modules: plant survey, habitat mapping and sedimentation measuring. In the morning, students groups covered two modules and then broke for lunch. In the afternoon, one module was covered, allowing time for students, kaitiaki and gear to be cleaned up, before meeting back at the marae for poroporoaki (formal reflection and farewells). At this point, a debrief discussion was held between kaitiaki, students and the supervising teachers, briefly discussing what was enjoyable about the experience, what was learned and what the students did not enjoy. After the debrief exchange, the formal poroporoaki process was completed, with acknowledgements on all sides, before the students departed the marae. After every wānanga, the kaitiaki and project group held a debrief, in which the day was reviewed and reflected upon.

Student feedback

Brief student feedback was obtained through a short survey questionnaire conducted either at the end of the day's activities or upon return to school. This feedback shows that student engagement in the activities and the benefits they report from the experience support the project as a valuable experience (see Tables 1–5). The student questionnaire asked a series of brief questions about overall student experience, along with gathering some basic demographic data. Overall, 107 complete responses were received from student respondents, from a total sample of 286 students who participated in the project and who had the opportunity to provide feedback. Of these respondents, 57 (53%) were female, and 48 (48.8%) male with 2 students identifying as gender diverse. Among respondents, 32 (30%) identified as Māori, 83 identified as NZ European (77%) and 22 (20%) identified as other ethnicities. Several respondents identified more than one ethnicity.

Tables 1–5. Post-event student evaluation data

Q 1. What did you think of the experience today?		
N = 107		
Response	Number	Percentage
It was ok	57	53.2
I loved it	50	46.7
Did not enjoy	0	0
Q 2. Did you learn something new?		
N = 107		
Response	Number	Percentage
A little	57	53.2
A lot	50	46.7

(Continued)

Tables 1–5. (Continued)

Q 2. Did you learn something new?		
N = 107		
Response	Number	Percentage
Nothing	0	0
Q 3. Would you do something like this again?		
N = 103		
Response	Number	Percentage
Maybe	38	37
Yes	64	63.1
No	0	0
Q 4. Did this experience increase your knowledge of science or the environment?		
N = 108		
Response	Number	Percentage
A little	68	62
A lot	40	37
Not at all	0	0
Q 5. Did this experience increase your knowledge of Māori culture?		
N = 107		
Response	Number	Percentage
A little	69	62
A lot	29	27
Not at all	9	8

Students were also asked for free text reflections on their experience. While these data are limited, it indicates that participants had a positive experience and enjoyed the opportunity to engage with kaitiaki in the marae and estuary settings. Typical responses included:

‘It was awesome . . .’

‘I had a lot of fun . . .’

‘I would love to come again and thank you so much for this experience . . .’

‘The [kaitiaki] made it so fun!’

Kōrerorero: Discussion

The Nga Waihotanga Iho: Marae environmental science project provides a general model of relevant, curriculum-ready, Indigenous-led environmental science and cultural education. In this model, tribal leadership implements specifically designed monitoring tools in culturally significant locations as a means of developing the tribal capacity to undertake environmental monitoring and guardianship, while also developing meaningful partnerships with local schools. Through the experience, students are made aware of local environmental changes taking place and how these

changes impact Māori values. They experience the monitoring of these changes through the integration of scientific and Māori approaches. Project leadership and authority rests with Māori-community leaders and marae kaitiaki who have pursued constructive relationships with local schools in order to achieve multiple tribal aspirations. As the project leader has commented,

[I]t is important for young people to engage with marae communities, especially on environmental issues because mātauranga Māori [Māori knowledge] encompasses holistic environmental management. The marae is the last bastion of the Māori world where tikanga Māori [protocols] is given full expression. Connecting young people to marae enables mana whenua [traditional authority holders] to uphold and share their cultural values and customs with the future kaitiaki of the Kaipara. It also provides an opportunity to tell their ancestral stories which enhances the overall experience for young people on marae (Miru, personal communication, 6 November, 2019).

The student response data are necessarily limited, given the constraints on collecting data from school children. These data are not intended to provide an evaluation of the experience or measure its efficacy in delivering complex Māori and science-based ideas in relation to the environment. Rather, these data show a ‘proof of concept’ that the marae-based monitoring experience is a viable, innovative environmental education tool. As is clear from the student response data, the project provided these students with valuable, enjoyable learning experiences. Most students expressed an interest in repeating the experience and reported increasing their knowledge of both science/the environment and Māori culture.

In order to achieve tribal aspirations, the project sought to demonstrate the viability of using the NIWA toolkit as the basis for enhanced environmental guardianship and engagement with local schools and students. NIWA designed the toolkit with these uses in mind and the project has demonstrated these tools can provide the foundation on which innovative learning experiences can be built. The work also showed that student engagement in these activities can be framed and presented from a Māori perspective in ways that mutually support and enhance understanding of both environmental science practices and Māori knowledge. Indeed, the project sought to lay aside divisions or delineations between ‘science’ and ‘Indigenous knowledge’ and demonstrated the compatibility and relevance of each through experiential learning. Additionally, by locating the experience at local marae and within local ecosystems, the project demonstrated the value and importance of local environmental awareness and understanding. The project leader reflected that making sure the students connected with their local environment was a central concern;

I wanted to educate students about kaitiakitanga [environmental guardianship], how Māori were spiritually connected to the environment through whakapapa [genealogy; the interrelationship of all things] . . . I wanted them to know about the importance of environmental restoration. The project provided an opportunity to turn the negative mindsets [about the local environment] on its head . . . I also wanted to inform students that we have to address the Kaipara’s biggest environmental disaster, which is siltation flowing from land management practices (Miru, personal communication, 6 November, 2019).

However, the experience of delivering these experiences also made clear to project participants that deeper and sustained engagement between the school, students and marae kaitiaki is necessary in order to fully realise the potential of this work. For teachers and students, this includes building these experiences into curriculum and extending learning with in-class teaching. For schools, it means committing to an ongoing relationship with Te Uri O Hau focused on marae-based learning and viewing Māori as partners in the work of educating young people, and through this relationship realising current education policy goals.

For Te Uri O Hau, a commitment to this work means continuing to support the development of tribal members to deliver these experiences and to lead environmental monitoring work in their district. Overall, sustaining and participating in these relationships and engagements contributes to the interconnected, long-term tribal goals of marae and cultural revitalisation, effective environmental guardianship and education.

As the project leader describes, this work is based on twin foundations: local environmental monitoring and education, yet provides an expansive vision of tribal development:

[the vision is]to create a resource management unit at each of the four ancestral Te Uri O Hau marae, managed by two fulltime kaitiaki from each respective marae. Kaitiaki would provide cultural and environmental programmes utilising the Nga Waihotanga Iho toolkit . . . These kaitiaki would also be engaged in the resource consenting process with the Kaipara District Council and Northland Regional Council within their rohe [district]. Schools around the Kaipara and the wider community could participate on these programmes thereby creating a template that schools throughout New Zealand could adopt. Fully trained up kaitiaki could also provide a training programme for other kaitiaki from other iwi [tribes] wishing to establish the programme within their rohe [district] (Miru, personal communication, 6 November, 2019).

Whakakapi: Conclusion

Notwithstanding the challenges which Māori communities continue to face, marae are fundamental institutions for the maintenance of Māori ways of being, doing, thinking and transmitting Maori knowledge and culture. Marae are also manifestations and enduring symbols of te tino rangatiratanga, or self-determination. The educational function of marae and associated cultural and community activities provides a focus for cultural vitality. Despite this, many marae, and the communities they serve, are recovering from sustained marginalisation, frequently as a direct result of state policy (in education, for instance). In recent years, an awareness that Māori success and achievement, *as Māori*, is entwined with wider community and cultural wellbeing, has emerged. Cultural security and confidence, and strong, equitable relationships between Māori communities, state institutions and other partners are critical factors in Māori development.

The *Ngā Waihotanga Iho* project, led by Te Uri O Hau, has shown how marae-centred education initiatives can foster and nurture interrelated tribal aspirations. These aspirations include the further development and expansion of kaitiakitanga, relationship building with local schools and contributing to the environmental and cultural awareness and understanding of local young people, as well as the legitimisation and reinforcement of Māori perspectives within mainstream curricula. In short, these are aspirations for determining and controlling their own future and influencing the life of the community. The project demonstrated the viability of NIWA designed monitoring tools as a vehicle for these goals, and how tools such as these can be used assertively by Māori in relation to environmental education. The toolkit provides accessible, practical methods of estuary monitoring and bases their use on both environmental and Māori values. The toolkit can be adapted to specific community needs; in the case of this project, tribal priorities (particularly sedimentation and related plant and habitat impacts) drove module choices. Student and teacher feedback show that the wānanga was a useful, stimulating experience worth repeating and the further embedding of estuary environmental monitoring into school science curriculum is made feasible through the toolkit's linkage with existing national curriculum.

Through this work, schools have had the opportunity to respond to tribal invitations to engage with Te Uri O Hau marae and with a project framework in which some of the promise of current education policy can be realised. By pursuing this work, Te Uri O Hau have offered schools access to community resources and assets, such as marae and tribal knowledge relating to whakapapa

(Māori genealogy and fundamental organising concept for Māori thought), history and environmental change. Lastly, the project presents an opportunity for schools to engage with Māori knowledge and values in authentic, mutually beneficial and supportive ways. Through these engagements, Māori can have a role in shaping teaching and learning in their region in ways that advances self-determination, that realise educational policy priorities and which generate greater awareness and appreciation for important ecosystems among regional young people.

Acknowledgements. The authors acknowledge the support of a number of organisations in completing this work. These include, the Te Uri O Hau Settlement Trust, Ōtamatea marae and Ōruawhāro marae, Ngā Kaitiaki O Te Uri O Hau, the National Institute of Water and Atmospheric Sciences and Te Kūwaha, and the principals, teachers and students of Ōtamatea High School and Rodney College.

Financial support. This project received funding from the New Zealand Ministry of Business Innovation and Employment's Unlocking Curious Minds Fund in 2016.

Conflicts of interest. This manuscript is original work which has not been submitted or published anywhere else.

Endnotes

1 Te Uri O Hau Claims Settlement Act (2002).

2 This method of data collection is limited but appropriate, given the constraints of a practical, field-based wānanga activity, and the involvement of school-age children. The gathering of student feedback was a requirement of the project funding agreement. All data gathering was subject to institutional ethics committee oversight (Unitec Institute of Technology Ethics Committee, UREC 2015-1058). The method was also endorsed by the Te Uri O Hau Settlement Trust.

References

- Adds, P., Hall, M., Higgins, R., & Higgins, T.R. (2011). Ask the posts of our house: using cultural spaces to encourage quality learning in higher education. *Teaching in Higher Education*, 16, 541–551.
- Berryman, M. (2013). Te Kotahitanga: Culturally responsive and relational pedagogies for teachers and students. In S. Katene & M. Mulholland (Eds.), *Future challenges for Māori: he kōrero anamata* (pp. 125–137). Wellington: Huia Publishers.
- Bowl, M. (2011). Communities of practice, compliance or resistance? Regional networks in the adult and community education sector in Aotearoa New Zealand. *Community Development Journal*, 46, 83–96.
- Forster, M. (2010). Recovering our ancestral landscapes: A wetland's story. In R. Selby, P. Moore & M. Mulholland (Eds.), *Māori and the Environment: Kaitiaki* (pp. 199–221). Wellington: Huia Publishers.
- Harmsworth, G., Awatere, S., & Robb, M. (2016). Indigenous Maori values and perspectives to inform freshwater management in Aotearoa New Zealand. *Ecology and Society*, 21, 9.
- Hepi, M., Foote, J., Makey, L., Badham, M., & Te Huna, A. (2018) Enabling mātauranga-informed management of the Kaipara Harbour, Aotearoa New Zealand. *New Zealand Journal of Marine and Freshwater Research*, 52, 497–510.
- Hoskins, T. (2017) A provocation for Kaupapa Māori. In T. Hoskins & A. Jones (Eds.), *Critical conversations in Kaupapa Māori* (pp. 95–109). Wellington: Huia.
- Hotere-Barnes, A., Bright, N., & Hutchings, J. (2014) Reo and mātauranga Māori revitalisation: learning visions for the future. *Future Education*, 1, 7–15.
- Integrated Kaipara Harbour Management Group (2011) *He Mahere Rautaki Whakakotahi integrated strategic plan of action, 2011–2021*. Whangarei, New Zealand: IKHMG.
- Kawharu, M. (2000). Kaitiakitanga. *Journal of the Polynesian Society*, 109, 349–370.
- Kawharu, M. (2014) Introduction. In M. Kawharu (Ed.) *Maranga Mai! Te Reo and Marae in crisis* (pp. 1–11). Auckland: Auckland University Press.
- Lambert, J. (2009) Māori symbolism – the enacted marae curriculum. In R. Selby (Ed.), *Indigenous voices indigenous symbols*. (pp. 29–37). Norway: WINHEC, Sami University College.
- Lee-Morgan, J. (2016) Marae-a-kūra: A culturally specific decolonising strategy in schools. In J. Hutchings & J. Lee-Morgan (Eds.), *Decolonisation in Aotearoa: Education, research and practice* (pp. 65–78). Wellington: NZCER Press.
- Makey, L., & Awatere, S. (2018) He Mahere Pāhekoheko Mō Kaipara Moana – Integrated Ecosystem-Based Management for Kaipara Harbour, Aotearoa New Zealand. *Society and Natural Resources*, 31, 1400–1418.
- Marsden, M. (2003) *The Woven Universe: Selected writings of Rev. Māori Marsden*. Masterton: Mauriora ki te ao.

- Ministry of Education** (2020) *Ka Hikitia – Ka Hāpaitia: The Māori Education strategy*. Ministry of Education. Available: <https://www.education.govt.nz/our-work/overall-strategies-and-policies/ka-hikitia-ka-hapaitia/ka-hikitia-ka-hapaitia-the-maori-education-strategy/>
- Mlcek, S., Timutimu, N., Mika, C., Aranga, M., Taipeti, N., Rangihau, T.R., Temara, T.M., Shepherd, Y., & McGarvey, H.** (2009) *Te piko o te māhuri, tērā te tupu o te rākau. Language and literacy in marae-based programmes*. Wellington: Ministry of Education.
- Moller, H., Lyver, P., Bragg, C., Newman, J., Clucas, R., Fletcher, D., . . . Rakiura Titi Islands Administering Body** (2009). Guidelines for participatory action research partnerships. *New Zealand Journal of Zoology*, 36, 211–241.
- Munford, R., & Walsh-Tapiata, W.** (2006) Community development: working in the bicultural context of Aotearoa New Zealand. *Community Development Journal*, 41, 426–442.
- Mutu, M.** (2010a) Constitutional intentions: The treaty of Waitangi texts. In M. Mulholland, & V. Tāwhai (Eds.), *Weeping waters: The treaty of Waitangi and constitutional change* (pp. 13–41). Wellington: Huia Publishers.
- Mutu, M.** (2010b) Ngāti Kahu kaitiakitanga. In R. Selby, P. Moore, & M. Mulholland (Eds.), *Māori and the environment: Kaitiaki* (pp. 13–37). Wellington: Huia Publishers.
- NIWA** (n.d) *Ngā Waihotanga Iho: Estuary Monitoring Toolkit – Te Uri O Hau roll-out draft report*. Wellington: NIWA: Te Kūwaha o Taihoro Nukurangi (National Centre of Māori Environmental Research).
- Panapa, K.** (2015) *Te Noho Kotahitanga: Putting the “critical” back in biculturalism*. Thesis, University of Auckland.
- Penitito, W.** (2010) *What’s Māori About Māori Education?* Wellington, NZ: Victoria University Press.
- Pihama, L., Cram, F. & Walker, S.** (2002). Creating Methodological Space: a literature review of kaupapa Māori research. *Canadian Journal of Native Education*, 26, 30–43.
- Resource Management Act** (1991) Available: https://legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html?search=qs_act%40bill%40regulation%40deemedreg_resources_resel_25_h&p=1&sr=1
- Smith, G.H.** (2017) Kaupapa Māori theory: Indigenous transforming of education. In T. Hoskins & A. Jones (Eds.), *Critical conversations in Kaupapa Māori* (pp. 79–95). Wellington: Huia.
- Swales, A., Rickard, D.F.T., Craggs, R.J., Morrison, M.A., Lundquist, C.J., Stott, R., . . . Smith, M.A.** (2011) *Ngā Waihotanga Iho: Estuary Monitoring Toolkit for Iwi*. Wellington: NIWA.
- Tangihare, M.T., & Twiname, L.** (2011) Providing space for Indigenous knowledge. *Journal of Management Education*, 35, 102–118.
- Te Awa Tupua Whanganui River Claims Settlement Act** (2017) Available: <https://www.legislation.govt.nz/act/public/2017/0007/latest/whole.html>
- Te Urewera Act** (2014) Available: https://legislation.govt.nz/act/public/2014/0051/latest/DLM6183601.html?search=qs_act%40bill%40regulation%40deemedreg_UREWERA_resel_25_h&p=1&sr=1
- Te Uri O Hau** (2011) *Te Uri O Hau Kaitiakitanga O Te Taiao*. Whangarei: Environs Holdings Ltd.
- Tipa, G.** (2010) Cultural opportunity assessments: Introducing a framework for assessing the suitability of stream flow from a cultural perspective. In R. Selby, P. Moore, & M. Mulholland (Eds.), *Māori and the Environment: Kaitiaki* (pp. 155–175). Wellington: Huia Publishers.
- Waikato Tainui Raupatu Claims Waikato River Settlement Act** (2010). Available: https://legislation.govt.nz/act/public/2010/0024/latest/DLM1630002.html?search=qs_act%40bill%40regulation%40deemedreg_waikato_resel_25_h&p=1&sr=1
- Waitangi Tribunal** (2014) *He Whakaputanga me te Tiriti, The Declaration and the Treaty: The report on stage 1 of the Paparahi o Te Raki Inquiry*. Wellington: Legislation Direct.
- Walker, R.** (2016) Reclaiming Māori education. In J. Hutchings & J. Lee-Morgan (Eds.), *Decolonisation in Aotearoa: Education, research and practice* (pp. 19–39). Wellington: NZCER Press.

Giles Dodson is a senior lecturer in the College of Humanities and Social Sciences, at Massey University.

Mikaera Miru (Te Uri O Hau) is a Te Uri O Hau elder and former project manager within the Te Uri O Hau Settlement Trust.

Cite this article: Dodson, G., & Miru, M. (2021). Ngā Waihotanga Iho: Self-determination through Indigenous environmental education in New Zealand. *Australian Journal of Environmental Education* 37, 254–265. <https://doi.org/10.1017/ae.2021.5>