Teaching the next generation of scientists to support communities in their restoration of ecosystems and ways of life

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Abstracts

He uaua te whāriki i te mātauranga me te mōhio whānuitanga ki te whakamahi ā-ringa nei i te tukanga pūtaiao, engari, he pitomata tōna e takatū ake ai ngā pia ki ā rātou ake mahi ā haere ake nei. Mō te taha ki ngā kaipūtaiao whakarae, ko te mea nui kia mārama rātou ki tā te kaipūtaiao mahi i roto i te pāpori, ki ngā matatika, ki te ngākau tapatahi, ki ngā āhuatanga ōrite o te mahi kōkiri me te pūtaiao matua, ki te whakatau puehu, ki te horopaki ā-hītori, ki te mahi hoki a te whakaturehanga me ō te marea whakaaro. Ko te AQFI 301 Field Methods for Assessment of Fisheries and Aquatic Habitats tētahi kōhi tōpū kaha i te Whare Wānanga o Ōtākou e arō pū ana ki ō te rohenga mahi, e hora nei i te āheinga ki te tauira kia whakamahia te pūtaiao hei rongoā i ngā tino take, me te tautoko mai a te hapori. Ko te tūāpapa o te kōhi ko te houruatanga mauroa ā-rangahau, ko Te Tiaki Mahinga Kai, nā, e kōrero nei mō te whakangungu i ngā wāhi e kīia nei e te tikanga he wāhi kohi kai. I tēnei houruatanga ka mahi tahi te hapori me ngā kairuruku kia tautokohia te whakahaere i te mahinga kaimoana tuku iho, ka mutu, ina whānui ake te titiro, te whakarauora i ngā pūnaha ā-pāpori, ā-hauropi anō hoki. Mā te tautoko i a Tangata Tiaki/Kaitiaki [1] (ko ngā kaitiaki/kaiwhakahaere ā-mahinga kaimoana tuku iho kua whakamanahia ki te whakaturehanga) ka tūhono atu te kōhi ki te hapori whānui (p.m. ngā kaipāmu, ngā rōpu whāomoomo rānei), ki ngā mahi iho pū a te marae, a te hapū, a te whānau anō hoki i ngā hapori taiwhenua. Kua poua te kōhi rohenga ki te marae o Ngāi Tahu, ko tāna hoki he whakapuaki i ngā tikanga me ngā kawa o te marae, o te mahinga kaimoana anō hoki. Ka whakaakona houruatia te AQFI 301 me te hapori, nā, e hora nei ngā hua ki ngā tauira, ki te Whare Wānanga, ki ngā kaiuru anō hoki o te hapori. He rerekē tā AQFI 301 titiro ki te whakaako i te pūtaiao koiora moana ki ngā whare wānanga auraki, he aronga nōna ki ngā hiahia me ngā wawata o ngā ahikā Māori o te hapori, he whakamārama hoki nōna ki te tauira me pēhea te whakamahi i te pūtaiao i ngā horopaki mātinitini. He whakahirahira nei te taiao waimāori me te taiao moana ki te Māori, koia pū tā mātou titiro ki te whakatipu i ngā pia e taea ai e rātou te mahi tahi ki te Māori, ki hapori kē atu rānei, i runga i te kauanuanu, i te whai take anō hoki. Ko tēnei tuhinga, e whakatakoto nei i ngā taunahua o te whāngai i te tauira ki ngā pūkenga whai tikanga o te whakaako i te pūtaiao mātauranga matua, e whakamahuki nei i te houruatanga me te hapori hei whakaako i te pūtaiao ā-ringa, e whakamārama nei i ngā whakaritehanga mō te kōhi rohenga, e whakamahuki nei hoki i te kōhi rohenga ā-noho marae me te kōrero i ngā pānga ki ngā rōpū kaiuru, i ngā ngoikorehanga me ngā whakatau anō hoki.

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[1] Local guardian or trustee of a specific area. Tangata Kaitiaki/Tiaki means any person appointed as Tangata Kaitiaki/Tiaki under the Fisheries (Kaimoana Customary Fishing) Regulations 1998 or the Fisheries (South Island Customary Fishing) Regulations 1999, being a member of the Tangata Whenua or a tangata whenua organisation or their notified representative. A Tangata Kaitiaki/Tiaki appointed under the Fisheries (Kaimoana Customary Fishing) Regulations 1998 or the Fisheries (South Island Customary Fishing) Regulations 1999 may authorise any individuals, in accordance with these regulations, to take any fish, aquatic life, or seaweed for customary food gathering purposes from within the whole or any part of the area/rohe moana, for which the Tangata Kaitiaki/Tiaki has been appointed. This term is defined in various Fisheries notices. Source: https://fs.fish.govt.nz/Page.aspx?pk=78&dk=1806

Chris Hepburn is Te Tiaki Mahinga Kai Project Co-Coordinator at Otago University. Professor Hepburn's work at the Department of Marine Science focuses on coastal ecosystems in southern New Zealand and in particular the impacts of human-induced change (e.g. elevated carbon dioxide, nutrient loading, sedimentation, fishing, invasive species) on the ecology of coastal seas. He leads a laboratory that is currently working on diverse topics that focus on habitats and species that support mahinga kai. Chris and his students work within Taiāpure and Mātaitai throughout Ngāi Tahu's Takiwa and more broadly in other coastal regions of New Zealand. He is a member of the East Otago Taiāpure Committee and is committed to supporting aspirations of local communities for better management of fisheries and ecosystems they rely on.

Providing expertise and high-level understanding in the practical application of the scientific process is challenging but has the potential to better prepare graduates for future careers. The key for frontline scientists is to understand the role of a scientist in society including ethics and integrity, the interface between advocacy and primary science, conflict resolution, historical context, and the role of legislation and public opinion. AQFI 301 Field Methods for Assessment of Fisheries and Aquatic Habitats is an intensive field-focussed course at the University of Otago that provides students with an opportunity to apply science to real issues with the support of the community. The course is built on the long-standing research partnership Te Tiaki Mahinga Kai, which means, guarding the customary food gathering areas. In this partnership communities and researchers work together to support customary fisheries management and, more broadly, the restoration of social-ecological systems. By supporting Tangata Tiaki/Kaitiaki [1] (legislatively empowered customary fishery managers/guardians) the course connects to the broader community (e.g. farmers, conservation groups) through the central role the marae (ancestral meeting house), hapū (subtribe) and whānau (families) play in many rural communities. The field course is based at a Ngāi Tahu marae (communal or sacred place) and provides an introduction to tikanga (custom) and kawa (protocol) at the marae and around fisheries. AQFI 301 is taught in partnership with the community, providing benefits to the students, the University and community participants. AQFI 301 takes a unique approach to teaching marine science in mainstream tertiary institutions as it is based on the needs and aspirations of local Māori communities and allows students to understand how science can be applied in different contexts. Freshwater and marine environments are of significant importance to Māori and this is our approach to building graduates who can work alongside Māori and other communities respectfully and in meaningful ways. This article outlines the challenge of providing practical skills to students in tertiary science teaching, describes a partnership with the community for teaching applied science, details the preparation for the field course, describes the noho marae-based field course and discusses the impacts on the participant groups, with limitations and conclusions.

The challenge: Providing practical skills to students in tertiary science teaching

Providing practical skills that underpin the more theoretical aspects offered in tertiary science programmes can be challenging (Linn *et al*. 2015). Training in the practical application of the scientific method from observation and question development through to reporting and delivery of findings to end-users (Figure 1) should be provided throughout tertiary science programmes (Windschitl *et al*. 2008; Corwin *et al*. 2015). For many students practical activities are key in providing the motivation to apply themselves in more theoretical parts of the degree programmes (Jackson *et al*. 2017). Practical aspects of courses can also help identify pathways for students to future study and improve their understanding of what they want to do for the first steps of their career – and importantly what they don't want to do.

In our experiences, laboratory and field-based aspects of courses are useful in teaching the practical aspects of science but sometimes lack wider context or purpose. Basic hands-on laboratory and field skills are important – they are fundamental in science careers – but some key skills have been completely lost from the scientific teaching toolbox (Windschitl *et al*. 2008). This 'activity without understanding' (Windschitl *et al*. 2008) can reduce authentic science experiences which promote scientific inquiry and create connections between concepts learnt in the classroom to everyday life (Oberhauser & LeBuhn 2012; Mitchell *et al*. 2017). Such experiences have been identified as lacking in New Zealand (Haigh *et al*. 2005), Australia (Mitchell *et al*. 2017) and the US (Oberhauser & LeBuhn 2012; Fukami 2013; Shah & Martinez 2016) resulting in students entering university with limited exposure to this way of learning (Oberhauser & LeBuhn 2012; Shah & Martinez 2016). Participating in research-based projects in undergraduate studies can increase the likelihood of students pursuing science-related careers or postgraduate studies (Linn *et al*. 2015; Mitchell *et al*. 2017; Corwin *et al*. 2015). Student learning experiences with a community relevance also make it more likely for students to engage with communities in the future (Oberhauser & LeBuhn 2012).

In the third and final year of undergraduate University science courses, many students want to apply skills developed on real issues and problems. Today, science students have strong interests in sustainability, conservation and new ways of managing the environment and natural resources. Empowering and encouraging future professionals to be on the front line of environmental and natural resource management will provide broader benefits to the wider community. Graduates must, however, understand the general process that underpins decision making, the limitations of what can be achieved and the advantages and disadvantages of advocacy *v*. primary research to inform decision making.

AQFI 301: A partnership with the community for teaching applied science

Here we offer an example of an undergraduate course that exposes students to fishery and environmental sciences, Aquaculture and Fisheries 301 Field Methods for Assessment of Fisheries and Aquatic Habitats also known as AQFI 301. This course provides the practical applications of the scientific process through developing and applying research questions that are based on problems faced by communities. Students then report their work back to community members and respond to feedback from end users. The challenges and benefits of this approach are shared through the experiences of the AQFI 301 teaching. The team includes Tangata Tiaki/Kaitiaki, community members, freshwater and marine scientists working for iwi, academic staff and former students. This multi-sectoral partnership team has its origin in the establishment of marine Customary Protected Areas (CPAs) by Te Rūnanga o Ngāi Tahu. The management committee of these CPAs are often made up of representatives from Iwi, recreational & commercial fishers, community environmental groups and scientists. Balance must be maintained when delivering teaching programmes of this type so that benefits flow to all members of the team. The partnership developed between university academics and the community allows a course like AQFI 301 to exist and also provides general lessons for the development of sustainable research and educational programmes with the wider community (Figure 2). To be successful, AQFI 301 must provide useful information to help Tangata Tiaki/Kaitiaki in their primary role of supporting the restoration of local ecosystems. That is the foundation of the partnership and the engine room for both teaching and learning.

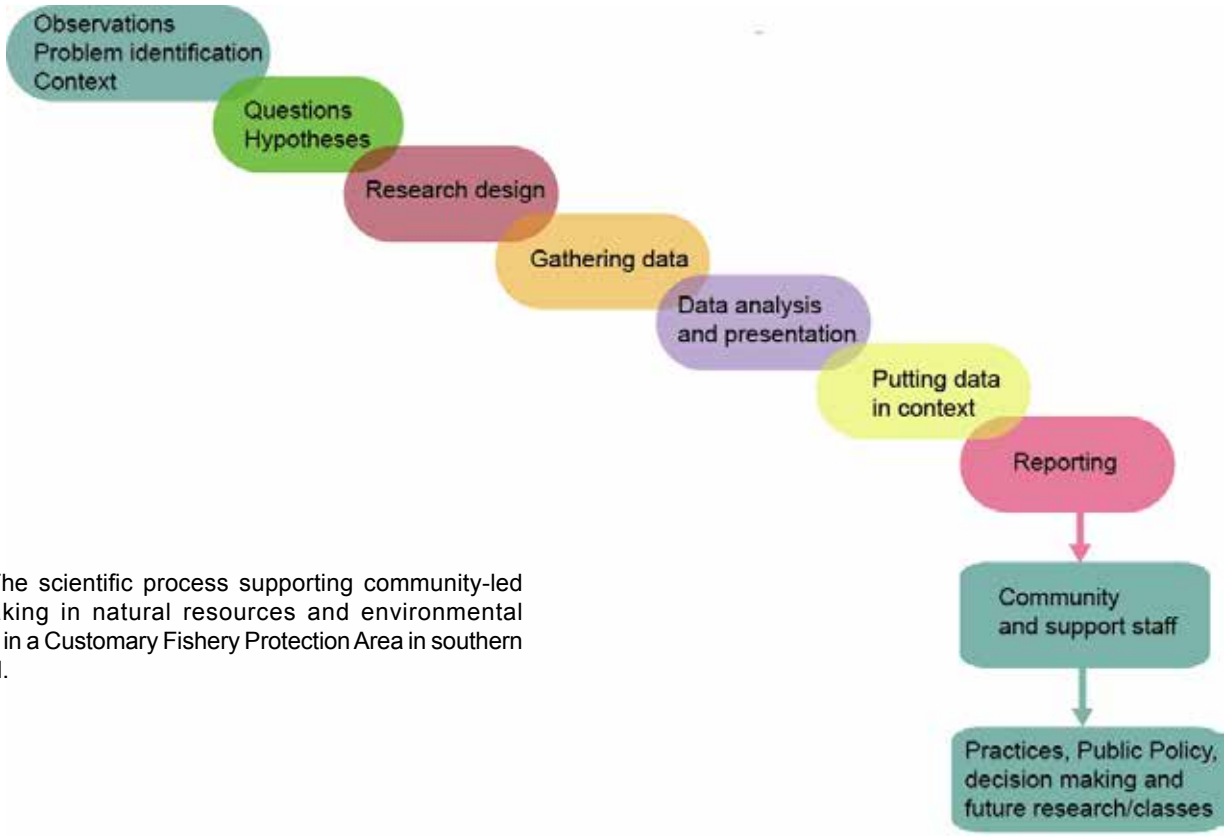

Figure 1. The scientific process supporting community-led decision making in natural resources and environmental management in a Customary Fishery Protection Area in southern New Zealand.

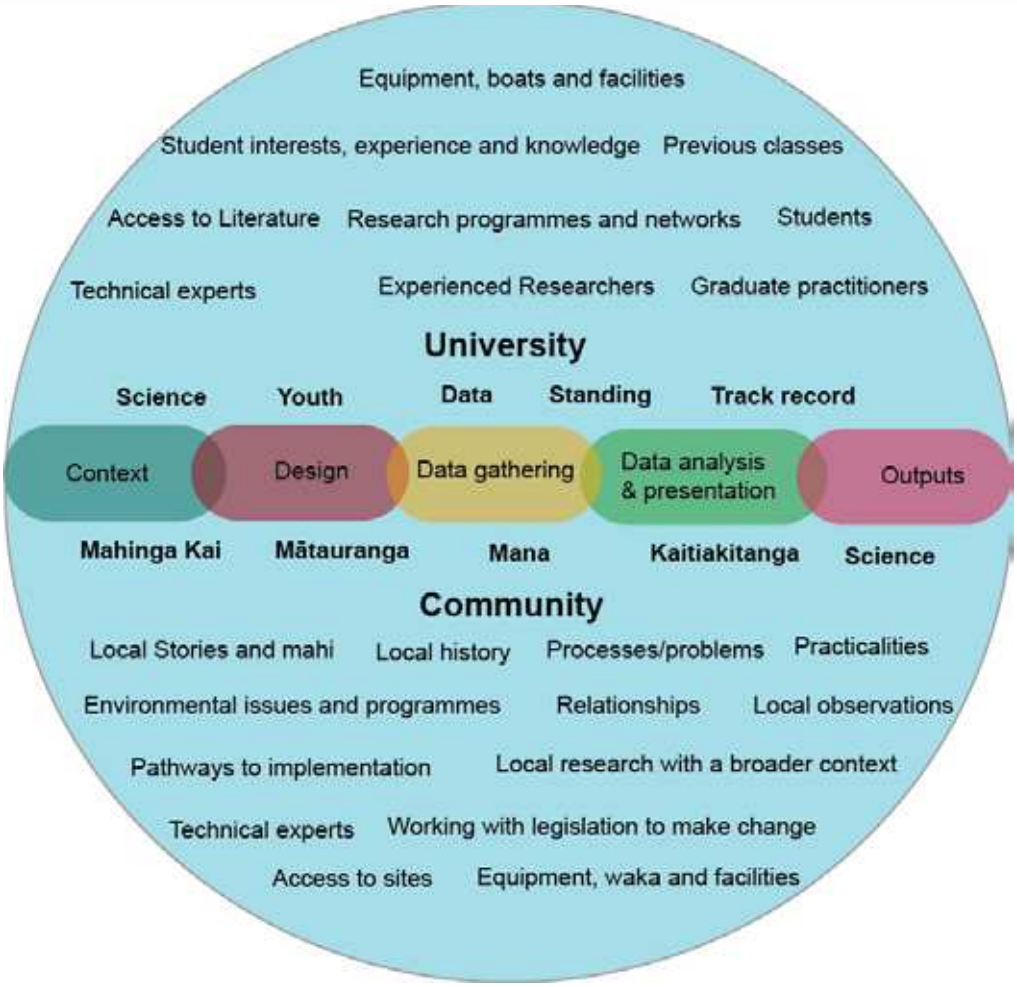

Figure 2. The partnership becomes blurred. Resources and strengths are provided by each side of the support team for AQFI 301. As each partner learns and builds capability, more and more aspects are provided by both sides of the partnership. Mutual respect is key, benefits are shared, and relationships and trust built – kanohi-ki-te-kanohi (face-to-face) and together through ongoing struggle to restore what has been lost and to build something new.

AQFI 301 enables holistic learning of the scientific process and helps students understand the role and limitations of science in society. The course is based within the East Otago Taiāpure and Waikouaiti Mātaitai CPA, and the broader cultural landscape of Kāti Huirapa ki Puketeraki on Otago's northern coast on New Zealand's South Island (Jackson *et al*. 2018; Hepburn *et al*. 2019). Alongside academic staff, Tangata Tiaki/Kaitiaki and their support staff, freshwater and marine scientists who work for the Te Rūnanga o Ngāi Tahu Mahinga Kai Monitoring and Enhancement Unit and other members of the community (e.g. conservation groups and farmers) support teaching. The course has a broad focus extending from rivers, estuaries and into coastal seas, consistent with the kaupapa of kaitiakitanga as applied locally as *'ki uta ki tai'* (mountains to the sea) (Hepburn *et al*. 2010). This is built from Te Tiaki Mahinga Kai (TMK), a long standing partnership programme between researchers and kaitiaki surrounding CPA (www.mahingakai.org.nz). Puketeraki Marae and its community are integral to the success of this course. The marae provides a base from which to conduct research and opportunities for formal and informal engagement with the community. Without the support of Kāti Huirapa Rūnaka ki Puketeraki the programme of research and learning would not be possible. The course has two distinct component parts. One is the University-based preparation for the noho marae and post-field workshops. The other is the noho marae encompassing the field work and community-based learning. Each of these two parts have activities that are best suited to the two distinct learning environments. These will be detailed in the following two sections.

Preparing for the course

The course begins with a series of seminars and workshops on campus. The initial learning phase is best suited to the University campus environment as students are not yet equipped to go straight onto the marae as a roopu. This preparation provides some historical, geographic, and cultural understanding of the area in which students will be working and living. Spanning almost 1000 years of history, there is a lot of material for students to consider. An introduction to what it is like to work with communities as a researcher and what to expect when living and working on the marae is provided. Aspects of Te Ao Māori (the Māori world), history, political boundaries, tribal and family units, tikanga and kawa on the marae are introduced. Aspects of local geography and history and the legislative processes that surround management of customary fisheries in New Zealand along with aspects of the Treaty of Waitangi as it applies to fisheries is also covered. This is very important as most science students do not have this background, many have not stayed on a marae and have little understanding of the Treaty of Waitangi. Students are prepared for their stay on the marae by learning about the pōwhiri (welcome ceremony on the marae), through a step-by-step process so they are more comfortable. Students develop a basic pepeha (who they are and where they are from), practise waiata (songs), and learn the importance and significance of karakia (incantation) in Te Ao Māori. The goal is enable students to be confident and comfortable when working with Tangata whenua[2] (local people).

Instructions and guidance on developing research questions, experimental design and the practical aspects of gathering and managing data are provided. Students learn about and are assessed on animal welfare ethics before they can handle animals in the course. Broader ethical questions around how to deal with sensitive fishery data are also discussed, e.g. what can it be used for? can it be shared? The answers are often found in doing the research and kōrero (conversation) in the field and on the marae. Questions and problems from the community and past research in the area are shared as a frame for the design of student projects and the research process and structure is guided by the teaching team. This design process is enabled by having students attend hui with the community such as East Otago Taiāpure Management Committee meetings. However, ultimately students have flexibility and can decide the direction of their projects. From this, students present a research question, preliminary plan and provide a list of equipment they need. Feedback is then provided from community members, scientists and academic staff to focus the project, give context and suggest alternative approaches.

Noho Marae

Most learning occurs when staying (noho) at the Marae, during the pōwhiri, mihi mihi (introductions) and doing the fieldwork, sharing the findings and reflection on the experience in the poroporoaki (farewell speeches). The marae is the best environment for this form of learning, as it brings the work, the issues and the people together in one place. The Tangata Tiaki/Kaitiaki involved with the programme also whakapapa to the marae. They provide an understanding of the kawa of the Marae and whaikōrero (formal speeches). A Māori academic staff member supports the class as kaikaranga (woman who makes a ceremonial call in a pōwhiri). Without these key people, engaging in the correct way on the Marae would be challenging. Leaders of the teaching staff are kaikōrero and speak on behalf of the students and the University. Students support speakers through waiata. The kōrero primarily surrounds the history of the people of the area, intrinsic connections of the people to te awa (river) and te tai (the coast), the relationship between Kāti Huirapa and University academics and students. A key theme is the foundational importance of education and knowledge. The message is that students should not be afraid to try, as everyone is learning and all are on different stages of that journey (Jackson *et al*. 2017).

Data collection

Once on the marae, learnings are less formal. Kōrero; during data entry, meal times, down time in the evenings, on the river or coast and working with people are learning experiences that are valuable, even if this value is difficult to quantify. Students work in small groups and are supported by experienced practitioners (e.g. scientists, Tangata Tiaki/Kaitiaki, academics). Often other members of the community come out to see field work, look at the methods being used and talk to students about their project. At all times

[2] Tangata whenua, in relation to a particular area, means the iwi, or hapu, that holds mana whenua over that area. Mana whenua means customary authority exercised by an iwi or hapu in an identified area, (Iorns Magallanes 2011).

of the day and night students and their supporters are on the local rivers, estuaries and coasts. Students direct their projects and are supported by a willing team of technicians from all the supporting groups involved in the course.

Once the field research is complete students give short (< 5 minutes) presentation on their work to the community, provide preliminary fresh results, images and videos of them at work. This presentation is key as it allows students to share their work while it is still fresh in their mind, allows feedback before the final reports are written and allows the community to see the human side of science that has been conducted. This also gives community members a chance to thank the students for their hard work – and to encourage them to be active 'voices' in their own communities for good science and community life.

Post-field workshops

After a reflection on the learning and experience of the noho marae at the poroporoaki, students return to campus for a statistics and data management workshop. Students are supported to develop reproducible data workflows. A benefit of this approach is that it demonstrates the importance of separating data collection, entry and validation (the 'raw data'), from data analysis. Separation of these concepts, which students often conflate, is introduced with a discussion that the raw data and supporting documentation (e.g. a README file) is an output from their projects that will be used more than once. Raw data from AQFI are treated as operational datasets within TMK and are stored for use by the community to support projects in the future. Students are encouraged and supported to use open-source statistical (e.g. R) and mapping software (QGIS). This means that practical skills developed in AQFI are immediately transferable to the workplace, even if graduates move to small- or medium-sized organisations that cannot provide access to expensive software licences for more popular tools. In many instances, the AQFI statistics and data management workshop is the first application of theory learnt at an undergraduate level to a 'real world' problem and the first experience of end-to-end data science.

Course assessment

The primary means of assessment for the course is an end-user focused scientific report. While other work in the course is conducted as a group (emphasising concepts of collaboration and team work), the final reports are produced individually. This provides an opportunity for students to extend themselves through additional background reading, literature review and/or data analysis. Students with outstanding final reports are often invited to present to the East Otago Taiāpure Research Evening, held annually in November on the marae and well attended by members of the community.

Impact

The partnership approach to teaching in AQFI 301 provides mutual benefits. This programme has been run annually since 2014. The faculty and students have benefited from being part of the local community and the community has gained invaluable information about local ecosystems. It has created learning opportunities for the community, students, and University staff and has allowed the sharing of knowledge of all types in a respectful way. Locally the research conducted in AQFI 301 has provided for input in many processes to date and provides a diverse data set to track the recovery of local systems over the 200-year vision for restoration held by Kāti Huirapa ki Puketeraki. The value of this data will only grow with time. This model closes the loop – ideas and problems from the community, provided to students, and returned back to the community with new knowledge that might allow action.

Students

Students learn how to be respectfully involved as a scientist in helping communities regain their roles as guardians of their local natural resources. The AQFI 301 course also allows science to be taught within a New Zealand context. Learning about fisheries management in a way that is useful for a community not only highlights the importance of relationships between communities and scientists to students, but also uncovers the need for multiple forms of knowledge in order to manage a place that is significant to multiple members of the community. From both formal course evaluation and informal feedback students appreciate being able to do 'real science' that is useful for the community. They like the freedom to pick their own topics, making their research more interesting. They value learning about 'pretty cool ecosystems', working with different people and understanding the dynamics of group projects. AQFI 301 provides a unique opportunity to fully participate in the planning, gathering and presenting of scientific data that is of relevance to a local community. Being able to collect information that was not only important for their own education but also was of interest to the local community was key. Research was done in a collaborative and supportive environment allowing access to knowledge from a range of experts. This experience provided insight into what it was like to work in science as well as introducing tools that would be invaluable in postgraduate studies.

Academics

Academics gain the benefit of working directly with Tangata Tiaki/Kaitiaki and other end users of the research. This helps build trust and relationships leading to further research. Academics also gain practical skills working alongside scientists from Te Tiaki Mahinga Kai who are experts in their field and have practical skills that can only be learned in a field setting. There are few examples of tertiary curriculum that are focused in a Māori context in sciences and certainly even fewer within the University of Otago. For academic staff this paper has provided a meaningful training ground for future scientists and researchers as well as providing real benefit to local community aspirations. Through the partnership approach, we have been able to create positive change for local issues, and furthermore train a new generation of scientists who are advocates for local, and local indigenous issues. The approach we have taken in this teaching has meant that we gain significant enjoyment and purpose in our work.

Community

From the community's perspective the student research has provided scientific results, data, information, and facts to support community 'voice' in interactions with territorial authorities. These mechanisms for reporting back demonstrate real respect for the community and acknowledge to

students that their research is valued and useful. It provides 'alerts" about what is happening in the research sites. It has boosted confidence in the community for advocating for improved regulation, practices, monitoring and compliance of resource consents affecting coastal waterways. This helps working with regional and city councils, non-government groups (e.g. Fish and Game) and landowners regarding best practice to maintain and enhance biodiversity and healthy waterways. It also informs and guides community conservation projects (science-based conservation). The 'snapshot science' provided by the student researchers has built up over time. Some of the subjects have been refined over time to develop into stronger longitudinal studies. This approach to teaching brings scientists and community members together to understand what's happening in our marine, estuarine and river environments in order to make better decisions around local responsible stewardship.

Kaimahi

For kaimahi (employees) scientists for Te Rūnanga o Ngāi Tahu, supporting the AQFI 301 course aligns closely with their primary role of supporting Tangata Tiaki/Kaitiaki and whānau. AQFI 301 provides a framework for students to understand the role of science in this kaupapa (purpose) and it is satisfying for kaimahi to support them in this journey. The key strength of AQFI 301 is its focus on linking science to community. Immersing students within the local community allows for a much deeper level of understanding of values, aspirations, and tikanga, which not only serves to guide the direction of their studies, but gives them an opportunity to contribute to an intergenerational kaupapa. The sense of worth generated by this connection has been a significant contributor to many students choosing to remain engaged with this kaupapa long after the field course is completed. This, in turn, has fostered lasting relationships among the students, community, organisations, and individuals who support this kaupapa and has achieved something that is much greater than the sum of its parts.

Tangata Tiaki/Kaitiaki

The benefit to Tangata Tiaki/Kaitiaki and Mahika Kai[3] (places and practice associated with wild food gathering) is greatly enhanced by the ongoing science and scientific knowledge willingly shared with this role and the need to be more fully educated as a community, in areas of significance for both. Understanding of the role that science and its application offers Tangata Tiaki/Kaitiaki as recipients allows a clearer knowledge exchange through science and mātauraka (knowledge held by practitioners and within practices) partnerships. That knowledge exchange uplifts and enhances our customary roles through these interactions . The ability to collaborate with science experts and their students continues to build understanding of our wai tai (seawater) and wai māori (freshwater) and how science and scientists treasure equally the ecosystems in which our kaimoana (seafood) live and grow. Going forward we are more fully able to live as the Iwi whakatauaki (proverb) intends; Mā tātou, aianei, me a muri ake. This takiwā will be a place where our mokopuna (decendents) will benefit from this significant and valued partnership and how we as kaitiaki (guardian) whether as scientists or as Tangata Tiaki/Kaitiaki, are better able to maintain ecosystems and steadily regenerate the health of the awa and moana (sea) over time as we encourage better management of whenua practices in our rohe (territory). This is what customary practitioners are charged with doing as kaitiaki and are aided by the ways in which science is better able to acknowledge the importance of science necessary to complete our kaitiakitaka (guardianship) and is where scientists (as students or professionals) are willing to share and apply their knowledge aided to through the combining of mātauraka with science.

[3] This paragraph is written in the voice of the Tangata Tiaki/Kaitiaki for Kāti Huirapa ki Puketeraki, so the southern dialect of Kāi Tahu (Ngāi Tahu), where K is substituted for Ng, is used.

Limitations

The relatively short timeframe of this course provides some limitations to the questions that students are able to address, especially in relation to some of the larger issues that the community is grappling with. This is well managed, however, by supporting students to design projects that are able to be integrated into a long-term narrative and be woven into a larger picture along with the work of past and future AQFI students. This course has been an entry point for students into community-based postgraduate research enabling longer-term projects to be conducted. The main limitation for rolling this type of course out in a wider context is that relationships and trust need to be developed first. This takes time and needs to happen at a tempo that all are comfortable with. Post-course evaluations are conducted to provide formal feedback from students in order to aid future improvements.

Conclusions

Scientists must consider cultural and historical context, how communities operate (relationships and conflict) and be able to conduct research in a respectful manner. They must walk the line, avoiding bias, to strengthen the value of their data in decision making but focus on questions relevant to local issues and receive input and support from end users to maximise utility. Noho marae provide a unique opportunity for students to learn what is expected when working with communities and to be open and ready to explain what the work is about and what underpins the approach used. Working with Tangata Tiaki/Kaitiaki who are legislatively empowered to change public policy and who possess relationships in the community to influence what people do strengthens the impact of research conducted on this course and also shows students how their research is used. This course supports the responsibility of mana whenua as they continue the task of active customary management in a modern landscape. The relationship between Mātauranga Māori and current science is as relevant now as it has ever been. The relationships that allow this approach are built and maintained through hard work on both sides and a shared commitment to the management of the fishery for everyone. AQFI 301 is really a celebration of the partnership and provides inspiration and hope that a generation of scientists will have some understanding of local context, history, and the importance of place when they are in a position to make a difference.

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