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- book reviews.

Publisher: The Technology, Environmental, Mathematics and Science (TEMS) Education Research Centre, which is part of the Division of Education, The University of Waikato, publishes the journal.

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Cover Design: Roger Joyce

This journal provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge.

ISSN: 2382-2007



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TECHNOLOGY EDUCATION

Challenges and opportunities in the indigenisation of the Marautanga Hangarau (the Māori-medium technology curriculum): Indigenous knowledge and an emerging philosophy of Hangarau

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Abstract

This article examines the challenges and opportunities in the indigenisation of the technology curriculum to support Māori-medium schooling. Since the emergence of indigenous curriculum design in Aotearoa New Zealand (NZ) in the 1990s in response to the emerging Māori-medium schooling movement, English-medium education and its philosophies, beliefs, and needs have prevailed. These Eurocentric beliefs and ideologies are often opposed to the key goals of Māori-medium education, including the aim of self-determination through the revitalisation of Māori language and mātauranga Māori (Māori knowledge).

Māori-medium is the collective term used by the New Zealand Ministry of Education to identify learning programmes where 51–100% of instruction is in Māori (Ministry of Education, 2022). These schools are officially required to implement the core national curriculum national framework for Māori-medium contexts including Hangarau (Technology).

This article shares initial findings about the development of Hangarau curriculum to date by drawing on primary data from a series of semi-structured interviews conducted with three mātanga Hangarau (Hangarau curriculum developers). The

mātanga were involved as curriculum designers, in the authoring of curriculum support materials, and design of professional learning for teachers.

Beyond the Aotearoa-NZ context, this study has wider implications for the decolonisation of technology education in general, which involves balancing and negotiating the tensions between indigenous and western, commercial and environmental, and general and local indigenous knowledge. As the sociocultural political landscape changes, and spaces for indigenous knowledges are being claimed, we need to remember what is important to our communities. We want to be working at the micro level, that of whānau and hapū (wider family) daily practices, reclaiming and reframing place-based knowledge as we identify its significance for the Hangarau curriculum.

Keywords

Indigenisation; Māori-medium Technology; Hangarau; curriculum

Introduction

Curriculum development is often controversial and highly political, particularly for disempowered indigenous communities, such as the Māori of Aotearoa New Zealand (NZ), attempting to revitalise their traditional language and culture. This study builds on an earlier study of the first two iterations of the Hangarau curriculum document (between 1999 and 2008) (Lemon, 2019; Lemon et al., 2019). The study examines the story of the struggles experienced to indigenise the Hangarau (Māori-medium technology) curriculum when Māori were given some authority, albeit limited to develop curriculum for Māori-medium schooling. One of the major struggles was how to develop a national curriculum from Māori cultural perspectives when for over 100 years in the Aotearoa NZ education system, curricula were traditionally developed from Pākehā (European) perspectives based on the needs of the European community. This paper examines the complex process of incorporating indigenous knowledge in a contemporary curriculum for students living in an increasing globalised world.

While Māori-medium curriculum development has taken place over the past 30 years, there is a paucity of Māori centric literature that has examined this development. An earlier paper by Lemon et al. (2020), provided a detailed outline of the research gaps. This paper addresses one of the gaps in the literature by exploring the challenges of indigenising the Hangarau curriculum—including the place and role of indigenous Māori knowledge; how the content, design, and structure of the marau (curriculum document) acknowledge and reflect indigenous knowledge. Those not involved in Māori-medium education may be puzzled about the need to investigate a fundamental key concept of Hangarau after three developments in the 1990s, 2008, and 2017. One would think that this issue would have been resolved by now. However, the urgency up until now lay in saving the language (Rameka & Peterson, 2021), and curriculum development issues are never fully resolved. There has been minimal formal research on the impact of these developments on classroom practice and design implications.

The Hangarau curriculum is in the process of being reviewed; thus, a further aim of this study was to inform future policy, which, in turn, will inform the current curriculum rewrite. This rewrite is expected to conclude in 2025 when it will be enacted at the micro-level of the classroom. The main research question for this paper is: What is an indigenous philosophy of Hangarau? This will be addressed through sub-research questions that explore fundamental key concepts in the indigenisation of the Hangarau curriculum—What is the place and role of indigenous Māori knowledge in Hangarau? How do the content, design, and structure of the marau acknowledge and reflect indigenous knowledge and pedagogy? What are the implications these concepts have on classroom implementation and the enactment of the marau Hangarau?

Literature

The struggles to indigenise curriculum in Aotearoa New Zealand

The indigenous people of Aotearoa-NZ had a robust education system for their children (Riini & Riini, 1993; Trinick, 2015; Winitana, 2012) before European arrival. Learning occurred informally through communal activities, such as food gathering and production, and formally in tribal higher learning institutes (wānanga) (Hemara, 2000; Trinick, 2015). After 1840, the increasing political power gained by Pākehā settlers resulted in a range of overt educational policies privileging English as the only language of education, making schools a key site of enduring colonisation (May & Hill, 2018). The hegemonic function of schools in the late 1800s and early 1900s was to provide a formalised context to assimilate Māori communities into European beliefs, attitudes, and practices, with the intent to “civilise” the Māori population (Simon, 1998). The use of the Māori language and culture was completely excluded in schools, and children were, in some cases, physically punished for speaking te reo Māori right up until the 1960s (Allen & Trinick, 2021; Simon & Smith, 2001). The effects of these education policies on the language usage are evident. May (2005) highlighted that by the 1960s, Aotearoa NZ was one of the most linguistically homogeneous countries in the world. By the 1970s the resulting language shift to English led to te reo Māori becoming an endangered language (Hunia et al., 2020; Spolsky, 2005), faced with possible extinction (Benton, 1979; Ngaha, 2011).

In the early 1980s, in response to the parlous state of the indigenous language and culture, Māori communities initiated Māori-medium education, initially outside of the state system. Kōhanga reo (early childhood Māori-medium language nests) and kura kaupapa (Māori-medium primary or elementary schools) were grass-root initiatives of the 1980s (Tocker, 2014, 2015; Waitangi Tribunal, 2013). At this time, many Māori communities established bilingual schools, kōhanga reo, and kura kaupapa Māori; however, in the absence of specific curricula and with very few Māori language resource materials available, these schools were required to follow the English-medium New Zealand syllabus (Lemon, 2019; Trinick & May, 2013). In the Western world, including Aotearoa NZ, neoliberal transformation began in the education system during the 1980s, including a controversial shift in thinking about how the curriculum was to be developed (Trinick, 2015). At first, there was no consideration of the Māori-medium curriculum despite Māori-medium schools being in existence for over 10 years. After considerable political agitation, the Ministry of Education belatedly agreed to the development of Māori-medium schooling curricula. Collectively, this became the catalyst that led to both the initial development of Māori-medium curricula and the introduction of Technology and Hangarau as new subjects or learning areas (see Lemon, 2019 for a comprehensive outline of the histories of Māori-medium education).

For expediency, in Aotearoa NZ, educational discourse (including this article), kura kaupapa Māori, kura-ā-iwi, and immersion units in English-medium schools are frequently homogenised using the term Māori-medium education. However, philosophically, structurally, and historically, immersion classes in mainstream schools, kura-a-iwi, and kura kaupapa are very different (May & Hill, 2018; Trinick, 2015). Māori-medium is the collective term used by the Ministry of Education to identify learning programmes where 51–100% of instruction is in te reo Māori (Ministry of Education, 2022a). These are known as Level 1 and Level 2 Māori language immersion programmes. These schools are required to implement the core national curriculum national framework for Māori-medium contexts including Hangarau (Technology) (Ministry of Education, 1999, 2008, 2017).

While Māori-medium schooling and associated curriculum development have significantly supported Māori language revitalisation, the same cannot be said of the reconstruction of indigenous knowledge. There are several reasons for this, including resistance to the inclusion of indigenous knowledge in state curricula, the shattering of indigenous knowledge systems due to colonisation, the diminishing number of practitioners of the knowledge still alive, and the lack of intergenerational transmission. The cumulative effects of over a century of colonisation in Aotearoa NZ and the assimilation, language loss,

and disruption of knowledge transmission have resulted in significant mātauranga (knowledge) gaps, which have impacted curriculum design. Knowledge must often be found, then researched and reclaimed before curriculum and pedagogical decisions can be made. A deep understanding of mātauranga Māori then affects the implementation of the curriculum, as it shapes processes and facilitates decision-making. The challenge then is that to realise the key goal(s) of Māori being able to live in te reo Māori requires access to Māori knowledge. Thus, this work aims to support this goal of knowledge revitalisation through the indigenisation of the curriculum. Indigenisation encompasses the normalisation of indigenous ways of being and knowing as opposed to the inclusion of aspects of indigenous knowledge and identity. As noted above, indigenous knowledge and/or the indigenisation of curricula is contentious in countries where the minority indigenous population has minimal power and authority.

Questions that should be asked in the consideration of the curriculum development include how do you determine the needs of the Māori-medium community across diverse groups? What is the relevance to our children? What is the connection and relevance to the present day? What about the preservation of traditional knowledge? For example, there is currently a problem with kauri dieback, a pathogen called *Phytophthora agathidicida* that is infecting and killing kauri trees, spreading through multiple stands of trees. A potential solution to this contemporary problem came from kōrero tuku iho, a traditional story whose learning was applied to solve a modern problem. This kōrero tuku iho shares the kinship connection between kauri and whales as brothers. A rongoā pani (Māori medical salve) treatment has been devised containing whalebone that is slowing down the spread of kauri dieback (Ngatae, 2020). This solution illustrates one of the key tensions that exists between indigenous and western knowledge reflected in the development of Technology and Hangarau. (See Lemon et al, in-press for a more detailed examination of mātauranga Māori and the conceptual metaphor used in representing the Hangarau curriculum. The initial findings from the semi-structured interviews in Section 3 outline the range of perspectives of the mātanga or expert participants in this study.)

Methodology

The article is positioned in an interpretivist paradigm, adhering in part to social realism, particularly in terms of the concepts of knowledge and curriculum creation. Although knowledge is socially produced, it is argued it can transcend context and become generalisable (Moore, 2007). A curriculum needs to be ordered in a coherent form to support busy teachers' enactment in classes. Practitioners will use the parts of the curriculum that make sense to them and are useful to them and ignore other sections and/or content. This research seeks to support implementation by ensuring the marautanga (Māori-medium curricula) identifies what is important to know and do, and is coherent, useful, and valid.

The study participants, who are considered experts or mātanga in this field of study, were purposely identified and contacted by email. Mātanga, in this case, are the experts with a teaching background, who have worked in curriculum development, the development of curriculum support materials, and the design and implementation of Professional Learning and Development (PLD) opportunities with teachers. Mātanga is a recently coined term used to represent someone who is an expert in a discipline or field in contrast to the traditional term for knowledge experts called "tohunga". Tohunga gained their knowledge from the ancestors and special schools of learning, whereas mātanga could become experts through more contemporary practices. For this study, the mātanga are individuals who have been involved since the inaugural curriculum development in the 1990s through to the current Marautanga Hangarau and the curriculum refresh. Mātanga views of the development of the Hangarau curriculum (Ministry of Education, 1999, 2008b, 2017) were examined and considerations about the indigenisation of the marau were identified and outlined. Participants shared their interpretation of the intent of the Hangarau curriculum document(s) and how specific development choices reflected indigenous knowledge and pedagogy.

Mātanga tuatahi (M1) was given responsibility for the management of the re-design of Te Marautanga o Aotearoa in 2004. She had over a decade of teaching experience within Māori-medium settings that

informed her practice. She has led capability training and the design of curriculum support materials for 18 years. Mātanga tuarua (M2) initially worked as part of the team writing the Science curriculum in the 1990s, as one of only a handful of secondary teachers at the time that was working on teaching Science and Maths in Māori. She led the development of the inaugural Hangarau document in the 1990s and has since transitioned to focusing her work on curriculum design, PLD, and the development of curriculum support materials for the Marautanga Pūtaiao (Māori-medium Science Curriculum). Mātanga tuatoru (M3) had teaching experience in English-medium contexts, in both Aotearoa and the UK, before working with colleagues in establishing a bilingual unit. Experience across the levels, working with six-year-olds through to secondary school students, and having a strong network of educators, led to this mātanga being part of the advisory group in the development of Science, before heading the development of Pāngarau in the 1990s. Subsequently, he led the re-development of Te Marautanga o Aotearoa and has worked across the curriculum in the standardisation of the lexicon. All these mātanga are involved in the curriculum refresh which has just started in Aotearoa NZ in 2021.

This study utilised an abductive data analyses approach, a synthesis of elements between inductive and deductive approaches, containing elements of thematic analysis. Braun and Clarke (2006) developed clear procedures for thematic analysis, as prior research conducted in their field of psychology had been lacking clarity. Both Guest et al. (2012), with their applied thematic analysis, and Thomas (2006) with his general inductive approach identified a need for a more comprehensive or detailed definition of research procedures informed by the approach to coding and analysis, rather than a specific ontological or epistemological framework. The data analysis approach for this research used an integrated approach to coding within a wider framework for analysis of the data, an adapted approach to thematic analysis (Braun & Clark, 2006; Guest et al., 2012; Thomas, 2006). First-cycle coding included in vivo coding (Charmaz, 2006; Corbin & Strauss, 2008) then focused coding (Charmaz, 2006; Saldaña, 2022) was implemented as the second-cycle coding method. Table 1 illustrates a section of a transcript. The bolded elements were used to generate the initial codes, which were then refined to generate codes for the dataset. Figure 1 illustrates how the codes were then arranged alphabetically as part of the process of focused coding and then the principles of thematic analysis were employed in identifying and grouping the codes into larger themes, as illustrated in Figure 2.

Table 1. In Vivo Coding (Literal, Verbatim, Inductive)

<i>Excerpt of interview with Mātanga 3</i>	<i>Initial codes</i>	<i>Refined codes</i>
I think the curriculum ought to be the guide . Schools need a guide . Teachers need a guide. But I think there should have been much more support, development, discussion, critique gone into developing localised curriculum , which, in turn, or if you like, localising the national curriculum . In terms of the line of authority, I think it best if our development in the 1990s should have been an overall guide and a significant effort gone into supporting the development of localised curriculum .	<p>“CURRICULUM OUGHT TO BE THE GUIDE”</p> <p>“SCHOOLS NEED A GUIDE”</p> <p>“DEVELOPING LOCALISED CURRICULUM”</p> <p>“LOCALISING THE NATIONAL CURRICULUM”</p>	<p>CURRICULUM AS GUIDE</p> <p>LOCALISED REGIONAL CURRICULUM</p> <p>SHIFT TO LOCAL ACCOUNTABILITY</p>

22. "CONTRACTED TO TRANSLATE"
23. "CRITICAL ANALYSIS BETWEEN PILLARS OF KNOWLEDGE"
24. "CURRICULUM DEVELOPER ROLE" – "IDENTIFY AND THEN CONSTRUCT"
25. "CURRICULUM OUGHT TO BE THE GUIDE" "SCHOOLS NEED A GUIDE"
26. "DEBATE – WHAT DO WE NEED TO PRESERVE? WHY?"
27. "DEBATE – WHAT IS RELEVANT FOR SCHOOLING?"
28. "DECIDE – ACCEPT THE CATEGORIES OF WESTERN DIVISIONS OF KNOWLEDGE?"
29. "DETERMINE WHAT IS IMPORTANT FOR KIDS TO KNOW AND BE ABLE TO DO"
30. "DEVELOPING HYBRID OF MĀORI AND WESTERN IDEAS"
31. "DEVELOPING LOCALISED CURRICULUM"
32. "DIFFERENT SKILLSET"

Figure 1. Second cycle coding (Focused coding).

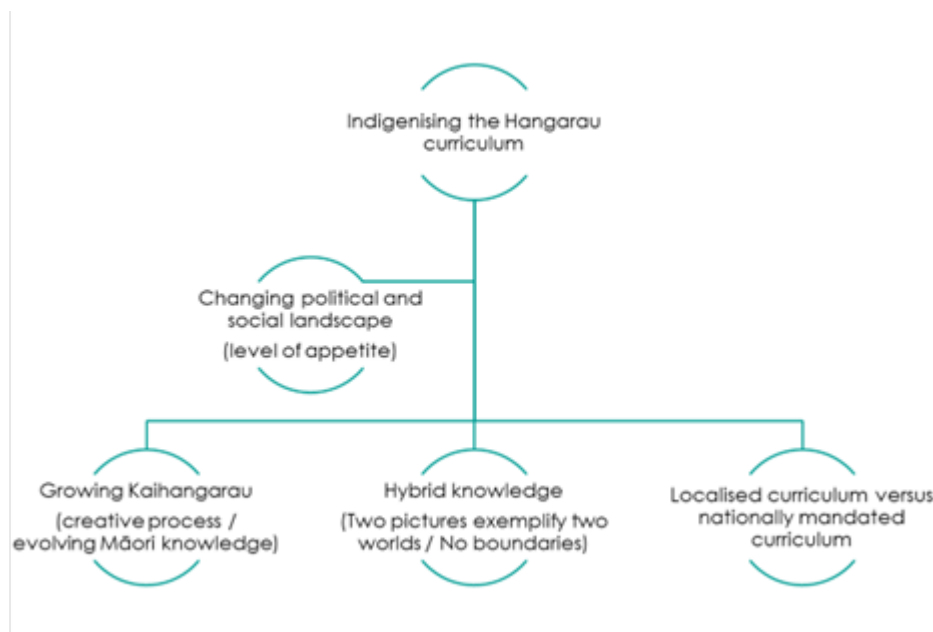


Figure 2. Code mapping and codeweaving.

Results and discussion

This section provides an overview of the results generated from the oral data and a brief preliminary discussion on the implications of these results. This study's initial findings are grouped around three key themes. First, defining and explaining the Hangarau curriculum—looking at the creativity required in Hangarau and the dynamic responsive nature of the Hangarau process. This theme contains aspects of an emerging philosophy of Hangarau with a focus on the place and role of indigenous Māori knowledge in the curriculum. Second, perceptions of the place of mātauranga Māori demonstrates a blending of the contemporary with links to the past and the combination of the old and the new. It includes a balance between entrepreneurship and stewardship but ensures that the focus remains on the body of evolving Māori knowledge, not a fixed and static view of traditional knowledge as belonging only to the past. Third, English and Western knowledge traditions and tensions in the incorporation of English traditions into mātauranga Māori. Then some initial conclusions are made.

Defining and explaining the Hangarau curriculum

All three mātanga discussed the significance of mātauranga Māori for the marau Hangarau, although the ways they saw this manifested in a curriculum were quite different. Mātanga 2 saw the potential for Hangarau as a decolonising curriculum, as a home for kōrero tuku iho (history through oral tradition).

In the early days of the inaugural development, a group of people gathered in Hamilton, including Wharehuia and others who were all local, and a kuia [a female elder]—Ngāneko Minhinnick—from Waikato, who worked in mental health in the region. She was closely positioned to the Waikato River. We were talking about what the term hangarau means. Her explanation of hangarau is what led to our development of the 1997 draft and the first curriculum document in 1999. She felt we needed to grow kaihangarau or technologists because if our children were kaihangarau, there would be some solutions that would not even be considered, such as the example of building a power station on the banks of the Waikato River. The river is an ancestor and it would not be appropriate to put hot water into her. You would look at some other solution in order to do what you wanted to do, to get the outcome that you wanted. What she was saying was that if you have the mātauranga Māori in your head and you understood it, then it impacts on what decisions you make.

The naming of the Hangarau contexts using parallels to the English contexts and the subsequent introduction of Hangarau Matihiko (Māori-medium Digital Technologies) was perceived as a move away from mātauranga Māori which led to this mātanga losing interest and focusing on other curriculum areas.

Mātanga 3 spoke of Hangarau as primarily a discipline that promoted problem-solving. However, before the important pedagogical and learning process could be considered, the developers were faced with a conundrum of how the content was to be organised—using Western divisions of knowledge or indigenous divisions of knowledge. There was a strong argument that Māori traditional categorisations of knowledge should be examined and contemporary meaning extrapolated. However, it was important to consider the knowledge relevant to children today and not just traditional:

The key to Hangarau is the whole creative process and that it's not static. It's not just about making hīnaki and nets and things that our ancestors used. It has to be contemporary and relevant to students and their world, whatever that world may be. It's just as valid I think for Māori to be entrepreneurs. The challenge of course is how they do so—it's a difficult balance—without ravaging the world's resources. The reality is there's a lot of technology which makes our life easier. There's lots of technology which makes our family's life easier. We don't want to be left out of that. That's my worry, is that it becomes all about Hangarau, or Pāngarau [Māori-medium maths curriculum]. It becomes all about traditional Māori knowledge, fixed in the past, not the evolving Māori knowledge.

Mātanga 1 spoke of how, in the second development cycle, during the mid-2000s, there was a metaphoric wrapping of the inaugural Hangarau document (whose structure had been represented through a woven whāriki or mat) around the moki fish that had been used to represent localised knowledge in the mid-2000s. This symbolically supported the opening lines, te iho o te hangarau, that communicated the aims of adapting traditional knowledge in the contemporary setting, which links back to the comments of Mātanga 3, in terms of ensuring that we do not get stuck in the historical, but remain in the evolving, dynamic nature of knowledge. Often “traditional” indigenous knowledge is assumed to be fixed, but as noted throughout this paper, the mātanga argue that knowledge develops and expands in relation to the world in which we live, so notions of static concepts or fixed notions are erroneous. However, questions continue to be asked, including which indigenous knowledge should be maintained or grown? How can we integrate the new in the old and what knowledge will best support

the next generations as they work towards being our technologists, our scientists, our thinkers, and our teachers? A significant aspect of Hangarau involves the decolonisation of the mind, as kaihangarau (Māori technologists) will follow different decision-making models because of a different worldview and its associated values and beliefs. There are tensions between notions of commerce and entrepreneurship and notions of kaitiakitanga or stewardship. Hangarau students are working on finding the balance between old and new, Western and Indigenous in their Hangarau practice.

Perceptions of the place of mātauranga Māori

Mātanga 3 felt that dealing with the issue of mātauranga Māori had been made unnecessarily complex. For example, the propensity to focus on mandated curriculum as opposed to prioritising place-based knowledge in the localised curriculum.

I think the curriculum ought to be the guide. Schools need a guide. Teachers need a guide. But I think there should have been much more support, development, discussion, critique gone into developing localised curriculum ... localising the national curriculum. In terms of the line of authority, I think it best if our development in the 1990s should have been an overall guide and a significant effort gone into supporting the development of localised curriculum. That's what I would have done if we'd had another go. In terms of the mandate, I would have mandated the localised regional curriculum rather than the state. So we've shifted the line of accountability, of authority, much closer to the local schools. At that time, we still had the legacy of that cohort of native speakers that we don't have any more, or very few, who could have contributed to the knowledge gap, to the disruption to the knowledge that we're still struggling with to this day. I think we'd have a completely different curriculum now if that was the case.

Mātanga 1 explained how a visual representation in the Pūtaiao document was used to communicate the place of Māori and Western knowledge-bases:

If you think about the Pūtaiao area, the diagram that sits within the Pūtaiao area shows two students—he kotiro, he tāne [female and male]—dressed in their school uniform, carrying their kete together and they are standing in front of their wharenuī (ancestral house) and then in the back, you can see the Sky City. What we were subtly trying to say is that not only are these tamariki expected to walk in two worlds, the mātauranga that they will have access to through this Marautanga, through this curriculum, will come from a Mātauranga Māori perspective and a Western worldview perspective.

Mātanga 1 noted how discussion on the use of metaphor in the curriculum often became the major talking point rather than discussion on curriculum content. Māori use metaphor frequently in narratives, a strategy adopted by the Hangarau curriculum developers often as an approach to illuminate mātauranga Māori. The use of imagery to implicitly communicate ideas about the importance of drawing from multiple knowledge bases or to communicate ideas about the importance of our ancestors is discussed further in the section above, called 'Defining and explaining the Hangarau curriculum'^[OB].

Mātanga 1 thought that the Hangarau curriculum was more than just learning knowledge or as an approach to solving problems.

What we needed the marautanga to articulate was that we wanted these kids to stand proud in their own country, be proud of who they are, understand their whakapapa, their history, all of it, around their identity, their language and their culture as well and then be able to take all of that whakaaro [thinking] out to their world, out to the wider world, always remembering that at the top, in the kapua [clouds], were the photos of their tūpuna, the people that paved the way for them to

be able to have the education that they have had access to, but equally so, for them to always remember that they never stand alone, that those people that not only paved the way that are their tūpuna are the people that are there behind them.

Mātanga 2 felt that in adopting the aho or transversal contexts that were being used by English-medium to organise the content in the 1999 to 2008 developments was not supporting the indigenising of the curriculum. Instead, Mātanga 2 argued that the development of Hangarau curriculum continued to privilege western knowledge:

It was how we could deal with mātauranga Māori without having to worry about all the different types of Hangarau from the Pākehā framework. It was about how we could work from a base of a problem that our tūpuna had to overcome so that they could survive, and how we were going to classify that knowledge, without translating it into one of the areas defined by the English-medium document.

I would talk about knowledge bases and about what informs your knowledge base. How you live your life and the knowledge you bring from your tūpuna [ancestors]. When you're talking about people like Ngāneko, she grew up with the knowledge of her tūpuna there and it was part of her. Of course, nowadays, it would be absolutely linked to Pūtaiao. I think that knowledge has been so disparate and separated as if there is a boundary, and that's what I think we're moving towards with the new Marautanga. Even though we're still working in Pāngarau and Pūtaiao [Māori-medium science curriculum]—I think the next step really is to have no boundaries and just have a think broadly about what we want our children to know. That's what I'm hoping will happen in the future. I can see it happening.

Matanga 2 argued that one approach to overcoming the propensity to focus on western knowledge was to focus on place-based knowledge—Māori, as a tribal society, would benefit from a transition to localised school curricula as opposed to the general mātauranga Māori that is endorsed in the nationally mandated curriculum. The knowledge base of the whānau (family), hapū (extended family), and iwi (tribal grouping) would be a stronger base to inform the next generations of kaihangarau (Māori technologists).

English and western knowledge traditions – design and content

Mātanga 3 could see value in considering which aspects of Western knowledge could support teaching and learning in the Māori-medium classroom:

I don't think incorporating English or Western traditions into Māori knowledge is necessarily a bad thing. What we've got to be careful about— what's desirable and what's not? What are we willing to change? What changes are desirable and what changes aren't?— seems to me the bigger question. Really what we're developing, what we're evolving is a kind of hybrid of Māori and Western ideas about technology. I don't think that's a bad thing. I think mātauranga Māori has now come to include Western ideas. The challenge then is—what do we need to preserve? Why? Now while learning to make crayfish pots is useful and it has its connections to the environment. For me, it's useful, but probably for 99.99% of our children, it has little use. So, whatever we do, it comes back to the relevant and contemporary, which is a big debate.

However, as noted by Mātanga 2, who decided to cease working in the Hangarau area because she felt that there was too much that was drawn from the English curriculum, she decided instead to focus on the Pūtaiao curriculum, which she argued provided greater scope to include kōrero tuku iho (histories and oral tradition):

It's really promoting mātauranga Māori, mātauranga Pūtaiao, mātauranga nō ngā iwi taketake [Māori knowledge bases, Science knowledge bases, indigenous knowledge bases] and a bit of where we're going in Level 3 Pūtaiao is a bit of critical analysis between pillars of knowledge by the time they get to Level 3.

Globalisation is continuing to shape knowledge bases and the increasing hybridity is natural. But we do need to actively work on selecting what is of import, so that it becomes Māori communities that are deciding what knowledge is of most worth, not successive government administrations. As part of the ongoing process of decolonisation, Hangarau encourages students and teachers to research, reclaim, and reframe knowledge as we are undergoing the Hangarau process in our classrooms.

Conclusions

The place and role of indigenous knowledge in an indigenous-centric curriculum are complex challenges to mediate after a century of colonisation in Aotearoa NZ. The cumulative effects of assimilation, language loss, and knowledge transmission disruption have resulted in significant knowledge gaps which have impacted curriculum design. The capacity to address the shattered knowledge systems has waned as the ancestors with this knowledge have passed on with minimal intergenerational transmission. As discussed above, mātauranga must often be found, then researched and reconstructed before curriculum and pedagogical decisions can be made. How mātauranga Māori is reflected in the curriculum impacts on the implementation of the curriculum and classroom practice. In education, pedagogy and curriculum blend as understanding how to teach and why you teach in a certain way.

To take a step back from the Aotearoa context, there are wider implications that this study holds for notions of decolonisation in Technology education, in general. Balancing and negotiating the tensions between indigenous and western, between commercial and environmental, and between general and local indigenous knowledge. As the socio-political landscape changes and the spaces for indigenous knowledges have been fought for and are being claimed, we need to remember what is important to our communities. The whānau and hapū daily practices at the micro level are where we want to be working on, reclaiming and reframing place-based knowledge, as we identify its significance for the Hangarau curriculum.

Glossary

Aotearoa	One of the traditional names for New Zealand, the land of the long white cloud
Hangarau	The Māori-medium Technology Curriculum. Hangarau is a component of the national curriculum framework for teaching and learning in Māori-medium contexts (Ministry of Education, 2008, 2017)
Hangarau Matihiko	Māori-medium Digital Technologies, introduced as a new part of the Hangarau curriculum in 2017
He kotiro	A female
He tāne	A male
Hīnaki	An eel trap, a wicker eel basket, a wire eel pot
Kaihangarau	Technologists
Kaitiakitanga carefully	Conservation, looking after the environment and managing resources
Kete	Woven flax basket
Kōhanga reo	Early childhood Māori-medium language nests
Kōrero tuku iho	A traditional story whose learning was applied to solve a modern problem

Kura kaupapa	Māori-medium primary or elementary schools that adhere to the principles of Te Aho Matua (Te Rūnanga Nui o Ngā Kura Kaupapa Māori o Aotearoa, 1994)
Māori-medium	Teaching and learning takes place in the medium of the Māori language. Māori language, cultural practices, values, and beliefs are the foundation of all teaching and learning
Marau or Marautanga	A curriculum Mātauranga Māori – The Māori knowledge-base, traditional contemporary, evolving, and responsive to each new generation
Mātanga	Experts in a particular field, experts with a teaching background who have worked variously in curriculum development, the development of curriculum support materials, and the design and implementation of Professional Learning and Development (PLD) opportunities with teachers. Mātanga is a recently coined term
Mātauranga Māori	Māori knowledge bases
Mātauranga nō ngā iwi taketake	- Indigenous knowledge bases
Mātauranga Pūtaiao	Science knowledge bases
Moki/Latridopsis ciliaris	- An attractive blue-grey-and-silver edible fish
Pākehā	European settlers
Pāngarau	Māori-medium Maths curriculum
Pūtaiao	Māori-medium Science curriculum
Rongoā pani	Māori medical salve
Tamariki	Children
Te iho o te hangarau	The essence of hangarau (the opening lines of the Hangarau curriculum document, composed by Mona and Sonny Riini, that distil the curriculum and its aims)
Tuarua	Second
Tuatahi	First
Tuatoru	Third
Tūpuna	Ancestors
Waikato	Collective name of the tribes living in the Waikato Basin (about one hour south of the Auckland region). Also the name of the river from which they take their name
Wānanga	Tribal higher learning institutes
Whareniui	Ancestral house, a central part of the Māori marae complex

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