Design and Technology Education: An International Journal

29.2

# Aligning Hangarau Perspectives: Exploring Curriculum Coherence in Māori-medium Technology Education

**Ruth Lemon, Waipapa Taumata Rau – University of Auckland, New Zealand**

## Abstract

This paper is the fourth in a series exploring the issue of curriculum coherence in the development and implementation of the three iterations of Māori-medium Technology curriculum from the 1990s to the present. For Indigenous schools, curriculum coherence is not just a structural design issue but also involves the place of their Indigenous knowledge systems, cultural values, and educational philosophies. This paper investigates the challenges and opportunities to develop a Māori-medium Technology curriculum based on an Indigenous philosophy of Hangarau. Data is drawn from Ministry of Education archival files and interviews with developers of curriculum and curriculum support materials. It utilises document analysis and interviews with curriculum experts (referred to as mātanga in this paper). This study reviews literature around curriculum design in Aotearoa New Zealand, particularly meta-analyses, and reviews, in the context of curriculum coherence. Curriculum coherence affects student learning across various levels: national, subject, school/classroom, and systems. It examines how curriculum coherence relates to the challenge of alignment between curriculum and curriculum support materials for teachers implementing the Hangarau curriculum, and the challenges in teaching of interpreting the learning outcomes. The paper concludes with recommendations to align national curriculum design, content, and implementation for more effective support of developers, teachers, students, and communities in Indigenous language learning contexts, enhancing student learning outcomes.

## Keywords

Hangarau, Māori-medium Technology, curriculum coherence, Indigenous Technology, Technology curriculum

## Introduction

In Aotearoa New Zealand (NZ) there are two nationally mandated curriculum frameworks, one for English language educational contexts, referred to as English-medium, and one for Māori language educational contexts, referred to as Māori-medium. Curriculum design for schooling in Aotearoa has evolved in response to a complex interplay of societal, technological, and educational influences, reflecting changing perspectives on teaching and learning and the evolving needs of students and communities. Similarly, curriculum design, both for Māori the Indigenous people of Aotearoa NZ and for other Indigenous groups globally has changed significantly over the decades, influenced by various factors including educational philosophies such as assimilation, globalisation, and changing societal needs. Much has been written about the impact of Eurocentric curriculum on Māori student experiences in English-medium education over the past 150 years (see Benton, 1979; May & Hill, 2018; McKenzie & Toia, 2022; Simon, 1992; Simon & Smith, 2001; Skerrett, 2019; Stewart & Tocker, 2021). However, there is a paucity of literature examining the impact of Māori curriculum design on Māori-medium education in Aotearoa NZ. This is in part because Māori-medium education and curriculum development are relatively new fields (emerging in the 1980s) and there are few researchers

working in these areas. Despite self-determination being one of the key ideologies underpinning Māori-medium education, because of its marginalised nature, it continues to be significantly impacted on by the ideologies underpinning the majority Eurocentric education system. This includes the needs of students in Māori-medium schooling still being determined by the needs of English-medium schooling (Toia, 2021; Trinick, 2015).

This paper examines how the Eurocentric ideologies of the state who control curriculum development in Aotearoa NZ has impacted on the coherence of the various iterations of Māori-medium curriculum development since the 1990s, with a particular focus on the Marautanga Hangarau [Māori-medium Technology curriculum]. Curriculum coherence refers to the logical and sequential connection between different elements of a curriculum, ensuring that each component aligns with the overall educational goals and objectives. It emphasizes a cohesive structure that promotes meaningful learning experiences for students (Roach et al., 2008; Wenzel, 2016). The study's methodology is examined, followed by a discussion of key findings arising from interviews with curriculum experts (referred to as mātanga in this paper) and Ministry of Education policy documentation. In consideration of the findings, a series of recommendations is made to better support the coherence of current and future Hangarau curriculum development and implementation.

**The Changing Educational Landscape of Curriculum Design for Māori**

Prior to colonisation, Māori education was primarily oral and experiential, centred on community, and lifelong learning (Hemara, 2000; Riini & Riini, 1993; Trinick, 2015). Elders played a crucial role in transmitting knowledge through practices such as taupuhi [observing children's dispositions to inform curriculum design], storytelling, and guiding children's participation in community activities (Hemara, 2000; Maxwell & Ngata, 2011; Maxwell et al., 2022). Learning was holistic, communal, and interconnected, without the compartmentalisation of knowledge into subject areas as is the case now.

With the arrival of Europeans in the 1800s came the introduction of novel technologies and writing systems, recognised by Māori for their economic potential (Petrie, 2006; Simon, 1992). Māori leaders sought literacy skills to navigate written agreements and treaties shaping interactions with Europeans. In these early interactions, there was the potential for an equal educational partnership in Aotearoa NZ (Jones & Jenkins, 2011; Lemon & Durham, 2017). However, two contrasting education goals were held by European and Māori during the early colonisation period (Hetaraka, 2022; Trinick, 2015). The Pākehā [European] dominated settler government aimed to assimilate Māori into European culture (Simon, 1992), while Māori welcomed Western education for its potential to enhance their way of life (Simon, 1992; Spolsky, 2005). Over time, power dynamics shifted as Europeans gained political control. Māori leaders sought to assert sovereignty and protect their lands, leading to the Declaration of Independence (Te Rua Mahara o Te Kāwanatanga: Archives New Zealand, n.d.) and Te Tiriti o Waitangi [The Māori-language version of The Treaty of Waitangi, popularly referred to as Te Tiriti] (Ministry for Culture and Heritage, 2023). Considered by many to be Aotearoa NZ's founding document which established a formal foundation for the relationship between the indigenous Māori people of New Zealand and the British Crown. It outlines principles of partnership, participation, and protection of Māori rights and interests (O'Malley & Harris, 2019; Wright, 2019), Te Tiriti reflects intricate dynamics between Māori and European interests, shaped by the context of the time and the evolving relationships between the

Indigenous population and the British Crown. These documents continue to be significant in Aotearoa NZ's contemporary education issues including in the development of curricula for Māori-medium schooling (McKenzie & Toia, 2022; Trinick, 2015).

Despite these early treaties in the 1800s recognising Indigenous Māori rights, by the turn of the 1900s, the state education system extended bans on the use of te reo Māori from classrooms to playgrounds (Hetaraka, 2022; O'Regan, 2018). Legislation like the Education Ordinance of 1847 and the 1867 Native Schools Act led to the complete exclusion of te reo Māori from many schools and the punishment of children for speaking it up to the 1960s (Simon & Smith, 2001; Skerrett, 2019). During this time, some formal resistance from Māori began to emerge to English-language hegemony in education, although in a limited form. However, after a century of absence, Māori language and culture were re-reintroduced as subjects into a few secondary schools in 1962 (Trinick, 2015).

Urban migration of Māori post-World War II completely altered the country's demographics (May & Hill, 2018), further contributing to language and cultural loss as Māori moved from communities where Māori language was commonly used to urban areas where te reo Māori [Māori language] use was actively discouraged (McKenzie & Toia, 2022). The change in the status of te reo Māori, from an initially high-status language of early colonial communication to a low-status language in Aotearoa NZ, was a major factor in the language shift to English in Māori communities. By the 1970s te reo Māori was considered an endangered language (Benton, 1979; Spolsky, 2005). It was against this background of rapid and significant language loss that Māori communities initiated bilingual education in Aotearoa NZ in the 1980s (May & Hill, 2018). These early bilingual schools were required to follow the English-medium syllabus for schools (Trinick, 2015)—there was no formal Māori-medium curriculum, and limited resource materials to support learning and teaching in te reo Māori.

**Contested nature of Māori-medium Curriculum development 1990s-2024**

After extensive lobbying by various Māori-medium education stakeholder groups for over 10 years, in the 1990s, the Government eventually agreed to develop Māori-medium curricula in the Māori language (McMurchy-Pilkington et al., 2013). While this recognition was agreeable on one level, as this was the first time in the long history of schooling that Māori educationalists (referred to in this paper as mātanga) were given any authority to develop State curricula, there was a requirement that the Māori-medium version be based on the parallel English-medium version (Lemon, 2019; Lemon et al., 2020; Trinick & May, 2013). This included the development of the Māori-medium Technology [Hangarau] version (Lemon, 2019; Lemon et al., 2020). Several of the group eventually contracted to develop the Māori-medium version had also been involved in developing the Technology curriculum (Ministry of Education, 1995). According to one of the informants for this study [Curriculum expert or Mātanga 4] there was a desire to design the inaugural Hangarau 'curriculum' based on Māori philosophies, but they were thwarted by contractual requirements including that the Māori-medium version be developed explicitly using the design of its English-medium counterpart (Lemon, 2019; Lemon et al., 2020). This lack of alignment between the philosophy of the Hangarau curriculum and Māori-medium schooling created several issues which persist to this day including the perpetuation of a Eurocentric bias in technology education and the reinforcement of the dominance of Western ways of knowing, further marginalising Indigenous voices and contributions (Lemon, 2019; Lemon et al., 2020).

In the subsequent round of development of Māori-medium curricula in 2007 and 2008, while there was a requirement that the basic structure of the 1996 curricula be maintained, there had been significant change in the Ministry of Education. As such, the government were much more accommodating of Māori attempts to indigenise Hangarau (Lemon, 2019; Mātanga 1; McMurchy-Pilkington et al., 2013), some of which were arguably represented through the increased use of metaphor in Te Marautanga o Aotearoa (TMoA; The national curriculum framework for Māori-medium education) (Mātanga 1; Mātanga 3). Māori capacity had increased with mātanga holding key positions in the Ministry, coupled with an increased capacity to write curricula, and there was a more robust round of community consultation during the second round of development (Ministry of Education, 1999-2008). Although there was still a paucity of research, work focused on Te Reo Matatini [Māori-medium literacy] Pāngarau [Māori-medium mathematics] and more generally on related concepts, was emerging. There was also an opportunity for the learning area teams to collaborate, which had not been allowed in the inaugural design of the 1990s (Mātanga 3; Mātanga 5). Time was invested in the TMoA principles re-development (the frontpiece, articulating the underlying beliefs, values, and theories guiding the development and implementation of TMoA) and in the standardisation of the lexicon across the curriculum areas (Lemon, 2019; Trinick, 2015).

**The Hangarau Curriculum Document**

The evolution of the Hangarau curriculum reflects a journey shaped by shifting educational paradigms and cultural aspirations. Initially, the curriculum design in the 1990s indicated a parallel structure to the English-medium Technology curriculum, depicted using an oval shape split into two strands: technological literacy and mātauranga Māori (societal knowledge and ethics). A whāriki [or woven mat] situated the seven kaupeka [transversal elements or contexts for learning, see 1 and 2 in Figure 1] for Hangarau practice in relationship to the two strands (see 3 and 4 in Figure 1). Subsequent iterations, particularly the establishment of Te Marautanga o Aotearoa [TMoA] in 2008, aimed to integrate Māori perspectives and values, involving collaborative stakeholder engagements, emphasising both linguistic consistency and cultural authenticity.

Hangarau became a core learning area (a compulsory subject to be taught in all classes from 2011) and was depicted using a moki [a species of trumpeter fish] wrapped in a whāriki [a woven flat mat]. This iteration continued to emphasise ethical practice, environmental stewardship, and the interdependence of Hangarau skills with Hangarau knowledge, with a stronger focus on the importance of local knowledge.

The seven kaupeka had been revised and there were now five named elements or contexts for learning, now referred to as aho. In 2017 one of the contexts was removed (ostensibly to be ‘embedded’ in practice throughout the rest of the Hangarau contexts) to accommodate the introduction of Hangarau Matihiko [Māori-medium Digital Technologies]. Through these transformations, the Hangarau curriculum continues to evolve, embodying a dynamic interplay between tradition and innovation, and serving as a testament to the resilience and adaptability of Māori-medium education (See Lemon 2019, Lemon et al, 2020; and 2023 for more in-depth explorations of the Hangarau curriculum documents).

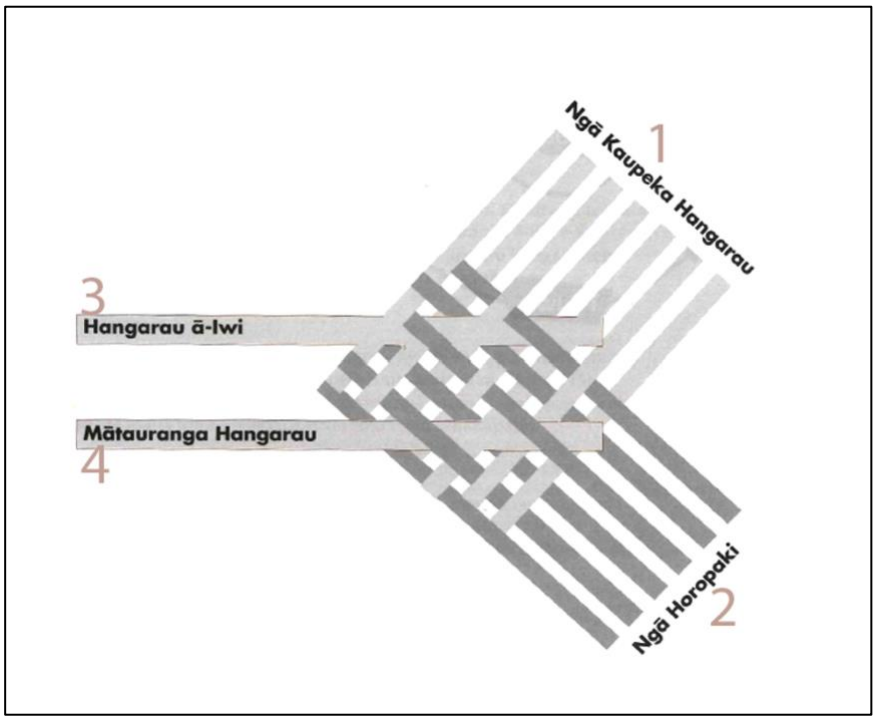


***Figure 1. The inaugural structure of Hangarau (Ministry of Education, 1999, p. 20). Reproduced with permission from the Ministry of Education.***

The philosophy of Hangarau seeks a balance between the preservation and reinterpretation of mātauranga Māori [Māori knowledge], integrating ethical decision-making, critical thinking, and sustainability principles into technological literacy education (made explicit through interviews with mātanga). It will be discussed further in the "discussion of data" section.

**Indigenising the Curricula: Where are we Now and Where to Next?**

Throughout the 2000s, more favourable education policies emerged, for example, the Ministry of Education commissioned a position paper on Aromatawai [Māori-medium assessment] (Pōhatu et al., 2014) that supported the illuminating of Māori knowledge in Māori-medium schooling. This assessment position paper advocated for the equal recognition or mana ōrite of Māori knowledge with Western in the National Certificate of Educational Achievement [NCEA]. NCEA is the senior secondary school assessment and credentialling framework into higher education in Aotearoa NZ. Mana ōrite acknowledges that Māori-medium and English-medium, have similarities and differences reflecting their respective communities' philosophies and world views (Pōhatu et al., 2014). The development of a Māori-medium assessment position paper supported a greater alignment of the Hangarau curriculum with Māori goals and aspirations for schooling (discussed in the methodology section). Mātanga Māori (Māori curriculum designers) conducted systematic literature reviews to inform the re-development of Te Marautanga o Aotearoa [TMoA] from 2023-2025 (Allen et al., 2022; Trinick et al., 2022) including discussions on unique Māori teaching and learning pedagogies. This included the concept of student-centred learning which was a common pedagogy adopted by Māori-medium schooling (Allen et al., 2022). However, the recommendation to the Ministry of Education was that the notion of child centred learning is different in Māori-medium in comparison to English-medium. The major difference is that the student in Māori-medium schooling is not just considered as an individual, but as a part of a community. The Māori

student-centred learning collective consisted of relationships with teachers, whānau [family], hapū [extended family] and others, as well as the dynamics of these ongoing relationships and connections to place-based knowledge. Additional research was commissioned by the Ministry of Education on the various competing theories on the organisation and sequencing of curricula including a design which best suited the needs of Māori-medium schooling (Trinick et al., 2022).

Collectively, this policy change and research (Allen et al., 2022; Pōhatu et al., 2014; Trinick et al., 2022) shifted the narrative informing the design of future curriculum to be better aligned to the philosophies of Māori-medium education. For example, the current 2023-25 re-development argues strongly for greater curriculum alignment philosophically between the early childhood, primary and secondary Māori-medium sectors. While there were still design constraints, there was a shift from the previous adherence to English-medium curriculum design as was the case in the 1990s to one that positioned Māori-medium curriculum design closer to realising the aspirations and goals of the Māori-medium education community (Toia, 2021). However, the Māori-medium education sector is very diverse politically. This adds to the challenges of developing a single state curriculum for all schooling models (Trinick & Heaton, 2020).

One of the other challenges is that about 70% of students in Māori-medium schooling transition out to English-medium schools after the primary school level (age 13) and do not attend wharekura [Māori-medium secondary schools, the last five years of formal schooling as teenagers]. On July 1, 2023, 5,238 Māori students were enrolled as secondary students in Māori-medium contexts (Education Counts, 2023). The issue of small scale is further exacerbated by only a few secondary students studying Hangarau at the upper levels of the secondary (Nippert, 2021). Of the few students choosing to take Hangarau as a subject, the majority are enrolling to complete their required assessments through the English-medium New Zealand Curriculum (Ministry of Education, 2017b) Technology Assessment Standards (Nippert, 2021) because there were not enough teachers with the expertise to teach at the upper levels, nor appropriate resources available. What this shows is there remains structural misalignment at the classroom level, thus leading to a great lack of coherence.

Greater governmental support is needed to minimise these challenges, grow the sector, and consider the future trajectory of the Māori-medium sector in the current 2023-25 curriculum refresh. Mātanga Māori interviewed for this study have advocated for systemic changes at all levels. They are not convinced that the ideal philosophical alignment has occurred yet, and work remains to develop a more authentic Indigenous curriculum (Ministry of Education, 2021; Te Pae Roa, 2022a, 2022b). Of current concern however, with a change to a more conservative government is whether developers will retain the latitude to develop a curriculum more reflective of Māori-medium schooling community aspirations and goals.

## Methodology: Curriculum Alignment and Coherence

This section provides an overview of the research methodology and the data collection method for this study. This paper builds on an earlier study that focused on the first two iterations of the Hangarau curriculum document between 1999 and 2008 (Lemon, 2019). This paper concentrates on the first three iterations of the Hangarau curriculum and the curriculum support materials (otherwise known as second tier materials), drawing in the current development cycle where appropriate.

Curriculum coherence, as a methodology, entails a systematic approach to designing, organising, and implementing a curriculum to ensure unity, alignment, and logical progression of learning experiences (Wenzel, 2016). Fullan's (2007) inquiry into curriculum implementation underscores the importance of coherence for sustaining effective educational practices over time. It highlights how a well-coordinated curriculum can enhance the sustainability of teaching and learning initiatives by aligning various components such as learning objectives, instructional materials, and assessments (Roach et al., 2008).

However, despite its benefits, the concept of curriculum coherence has weaknesses. For instance, rigid adherence to predetermined curriculum structures could stifle creativity and flexibility in responding to diverse student needs and changing educational contexts. Additionally, achieving coherence across all levels of the education system may pose challenges due to differences in priorities, resources, and stakeholder interests (Sullanmaa et al., 2021). Thus, while curriculum coherence is valuable for promoting effective teaching and learning, careful consideration of its limitations and adaptability is essential for its successful implementation. Successful implementation of curriculum coherence plays a large role in ensuring consistent and robust curriculum delivery across the school, thereby improving the quality of students' school experience.

**Data Collection Methods**

There were two sources of data for this paper. The first was secondary data collection which involved a series of information requests to the Ministry of Education (the agency primarily responsible for curriculum development and the authoring of second tier professional development and teaching support materials in New Zealand) under the Official Information Act 1982. The dataset included: Contracts; schedules of payment; budgets; milestone reports; letters to schools; press releases; email trails; meeting minutes; surveys; production schedules; working drafts of both the curriculum statements, and potential structures, as well as drafts at various stages in the production of a range of resources – including video, DVD, written and online materials (Ministry of Education, 1999-2000a; 1999-2000b; 1999-2003; 1999-2008; 2003-2012; 2007-2009; 2008-2010; 2010-2011). The milestone reports and working drafts were particularly helpful in communicating key thinking about curriculum development and curriculum support materials at that time.

The second data source was interviews with experts, or mātanga who were involved in the development and/or implementation of the Hangarau curriculum during its three developments, in the 1990s, 2006-8, 2015-2017, Mātanga 1-3 [coded as M1-3] being involved in the current curriculum refresh which started in Aotearoa NZ in 2021. In the Indigenous Māori context, mātanga are considered experts in a particular field. In this paper, it refers to experts with a teaching background, who have worked on the Hangarau curriculum, and have worked on the development, implementation, trialling, and distribution of second tier materials to schools (see Lemon, 2023 for a discussion focusing on Professional Learning Development). Due to the incredibly small pool of mātanga in the Māori-medium education sector, anonymity and confidentiality could not be assured. All mātanga had the choice – first, to participate in the research; and second, whether they wanted to use a pseudonym or their real name. All left the choice up to me, so I have used pseudonyms, erring on the side of caution. Interviews were conducted with five mātanga. Their views of the development of the Hangarau curriculum

(Ministry of Education, 1999, 2008, 2017a) with respect to the nature of curriculum and its second-tier materials are discussed after the mātanga are introduced below.

Mātanga tuatahi [M1] managed the re-design of Te Marautanga o Aotearoa [TMoA] in 2004, leading the design of curriculum support materials for 18 years. Mātanga tuarua [M2] led the inaugural Hangarau document development in the 1990s. Mātanga tuatoru [M3] was in the advisory group for science, before leading Pāngarau [Māori-medium mathematics] development in the 1990s. M3 also worked on the standardisation of the lexicon across TMoA. Mātanga tuawhā [M4], initially contributed to Technology curriculum development before joining the inaugural writing team for Hangarau and then working as a Facilitator. Mātanga tuarima [M5] was a PLD facilitator, regional coordinator, and designer of second tier curriculum support materials. M5's focus has been on providing classroom teachers with resources for exploring and engaging with the Hangarau curriculum. M5 was a member of the Hangarau Matihiko [Māori-medium Digital Technologies] reference group (Ministry of Education, 2017a).

**Coding and Data Analysis**

The dataset, the documents and the interviews, were coded and analysed using “In Vivo Coding” (Saldaña, 2022, pp. 137-143) for the first-cycle of coding, and then “Focused Coding” (pp. 307-307) was applied for the second-cycle of coding. Analysis was conducted through an adapted approach to thematic analysis (Braun & Clark, 2006; Guest et al., 2012; Thomas, 2006). Initial In Vivo codes were generated for the complete dataset, then a second cycle of Focused Coding was conducted (See Lemon et al., 2023 for more detail on coding and analysis). An outline of the synthesis in relation to the Hangarau curriculum and its support materials is discussed below. Table 1 shares an outline of the key second tier Hangarau curriculum materials that were detailed in the documents and then each of the following notions identified as being a significant notion in relation to first and second tier materials from the dataset is outlined briefly. The findings have been summarised very briefly in the next section.

***Table 1. Second-tier Hangarau Curriculum materials focused on in the Ministry of Education documents sourced under the Official Information Act 1982***

| Date/Year | Authors | Description | Request # |
|---|---|---|---|
| 1999 | Copeland Wilson and Associates | Hangarau video | 1100564 |
| 1999 | Waiti Associates Ltd | A teachers’ handbook aimed specifically at supporting programme development at secondary school (I have been unable to source a final copy of this resource). | 1139624 and 1242781 |
| 2001-2003 | Te Tihi | Tauaromahi [exemplars] project | 1100564 |
| 2007-2009 | Huia | A Hangarau Koiora [Māori-medium Biotechnology] text focused on supporting teachers of students working at level 6. | 1118980 |
| 2008-2010 | Tihi Ltd and Palisade Film Productions | From tender round for Māori-medium materials to final milestone (including draft content), focusing on the DVD set, with accompanying student books, aimed at teachers of year 9 and 10 students (junior secondary) | 1207583 |

| | | | |
|---|---|---|---|
| 2010-2011 | Kōtaretū | Organising a re-print of two key resources – 1,000 copies of Hei Tautoko i te Hangarau; and 300 copies of the DVDs, each of the student books and of the teacher's book for Tūhurutia te Ao Hangarau. | 1241126 |

## Discussion of Data

While the main aim of the paper was to examine the alignment and thus coherence of the Hangarau curriculum at all levels, a secondary aim was to examine an Indigenous philosophy of Hangarau, how this influenced the content, design, and structure of the marau [curriculum], acknowledging, and reflecting Indigenous knowledge, and pedagogy. It was also important to consider the implications these concepts have on classroom implementation and the enactment of the marau Hangarau. One of the key factors impacting on the design was linguistic. That is because language plays a crucial role in curriculum design and writing as it determines how content is communicated, understood, and internalised by learners. The choice of language can influence accessibility, inclusivity, and cultural relevance within the curriculum. It shapes the clarity of instructions, the presentation of concepts, and the development of learning materials, impacting students' engagement and comprehension. King Charlemagne is quoted as saying, 'To have another language is to possess another soul' (n.d.).

Researchers in the field of sociolinguistics tend to agree that, while more research is needed, to some degree, your personality and your behaviour, down to the decisions you make are influenced by the language you are speaking (Bialystok, 2017; Chen, 2013; Cook, 2008; Harrison, 2010; Kramsch, 2014; Royal, 2019; Sapir, 2002; Stewart, 2020; Whorf, 1956). One of the central themes that emerged from the interviews was the important role of language serving as a lens through which individuals and groups perceive and interpret their surroundings. When a language is lost or marginalised, vital cultural and conceptual frameworks embedded within that language may also be lost (Royal, 2019; Trinick, 2015). Revitalising a language allows its speakers to reconnect with unique ways of understanding and interpreting the world, potentially leading to shifts in perception and worldview. Language is closely tied to individual and collective identities (Bialystok, 2017; Harrison, 2010; Stewart, 2020). Speaking a particular language is often intertwined with one's sense of belonging to a cultural or ethnic group (Boroditsky, 2001; Stewart, 2020). When a language is endangered or suppressed, it can lead to feelings of cultural disconnection and loss of identity (Kramsch, 2014; Royal, 2019). Revitalising a language can strengthen cultural pride and identity among its speakers, fostering a sense of community and belonging. Language not only reflects cultural norms and values but also shapes social interactions and behaviour. Revitalising a language can lead to changes in social dynamics, communication patterns, and interpersonal relationships within a community. It may also promote intergenerational transmission of cultural knowledge and traditions, influencing social cohesion and collective action (Stewart, 2020). Thus, for Māori-medium education the revitalisation of te reo Māori [Māori language] is a critical goal of Māori-medium education. This critical goal seeps through out the sector including influencing how the matanga interviewed for this paper viewed Hangarau curriculum development.

> *We fought as Māori for the revitalisation of the reo, for the revitalisation of our taonga [treasures], of our practices and hangarau was going to be, like every other thing, a vehicle to get that back. (Mātanga 4) "Mātauranga Māori [Māori knowledgebase], te reo Māori was everything" (Mātanga 1).*

Another theme was the need to increase the presence of mātauranga Māori in the curriculum, initially through the preservation of knowledge, to an attempt now at grounding the document in mātauranga Māori and supporting schools in the development of localised curriculum: "The bits and pieces of narrative that people bring to a practice, and no-one was incorrect" (Mātanga 4). "Te whakamana i ngā mātauranga o ngā tūpuna kia ora ai" (Mātanga 5; Normalising/validating/celebrating the knowledge of the ancestors to thrive). All mātanga spoke of the importance of researching, reclaiming and reframing mātauranga Māori, which in the 1990s, was aiming at being a decolonising curriculum:

> *This was the first official curriculum that said, Māori mā [addressing Māori people as a collective]. Here it is. Make it your own. Do what your old people used to do and make it your own so that our kids in the next generations always know where they came from – what the whakapapa [origins and development] of this taonga was. … The heart of the matter is still hangarau and our kids' ability to take what our tupuna [ancestors] did and move that on to their own space in the digital future. (Mātanga 5)*

There was also emphasis placed on the need for hybridity and evolution of the knowledgebase (Allen, 2023). The concept of students walking in two worlds – one rooted in mātauranga Māori and the other in a Western worldview – may no longer be referring to two separate and disparate worlds. The mātanga acknowledge the importance of relevance and adaptability, with a need now to reflect on what aspects of the knowledgebase are most important for our next generations. There is a highlighted need for a clear distinction between national guidelines and curriculum frameworks and locally developed curricula, supported adequately by the government.

> *I'd like to see the emphasis shift more to supporting schools to develop their localised curriculum or regional curriculum or an iwi [tribal] curriculum and the Ministry resources this because the schools can't do it by themselves (Mātanga 3) "…how they get involved and what their local knowledge means to any solutions that are found" (Mātanga 2).*

Another major issue that disrupted alignment was the lack of support resources, either in text and electronic form and critically in adequate teacher supply. This is made more significant because of the correlating lack of ongoing systematic Professional Learning and Development [PLD] as suggested by Lemon (2023). Additionally, the creation of robust materials is proposed to assist kaiako [educators] at all levels of the curriculum. "The purpose of the second-tier material was to guide our teachers to understand where they could go to, to help them create difference in their spaces" (Mātanga 1). This theme highlights the importance of providing support, resources, and training to educators to ensure that they can deliver the curriculum in a way that resonates with students and promotes their success. By investing in educators' professional development, the curriculum can be effectively implemented to provide a culturally responsive and empowering educational experience for students.

One of the yet unresolved issues is the debate on what constitutes an Indigenous philosophy of Hangarau. From the perspective of the mātanga, the philosophy of Hangarau, is firstly about ngā taonga tuku iho [ancestral wisdom and traditions], recognising the need for a balance between traditional Māori knowledge and evolving Māori knowledge, and considering what knowledge is the most relevant to this generation of learners (Ministry of Education, 1999-2000a, 1999-2000b, 1999-2008, 2007-2009; 2008-2010; 2003-2012). "What informs your

knowledge base? How you live your life and the knowledge you bring from your tūpuna [ancestors]" (Mātanga 2). Mātanga 2 aimed to ensure that the next generations learned at school:

> *how clever our tūpuna were… [For example] with the maramataka [Māori divisions of time] … Night after night, morning after morning, looking here, seeing what's happening here, linking it all together. That development was stunning, how they interpreted their world.*

The ongoing disruption of ngā taonga tuku iho [ancestral treasures passed down through the generations] because of colonialism required creative approaches in re-building the knowledge base. Mātanga 4 spoke of the approach used by Hirini Melbourne, who was one mātanga who worked tirelessly in re-building the puoro [music] knowledgebase, linking this approach to the ways mātanga Hangarau worked in the 1990s and 2000s: "They worked out that you could do that if you listened to lots of people, because everyone had a piece of the knowledge." This valuing of the knowledge that tūpuna [ancestors] had did not equate to knowledge being frozen in time and stuck in the past. The preservation of mātauranga Māori was one of the key goals of a decolonising curriculum. The nature of a knowledgebase is that it changes in relation to changing ideas, processes, ways of being. But the knowledge needed to be reclaimed before it could be reframed. Mātanga 1 explains the links between past, present, traditional, and 'technical' through reference to the metaphor that was used to structure the 2008 iteration of the Hangarau curriculum:

> *When you look at the Hangarau learning area with the moki [a species of blue trumpeter fish] and the fact that the moki is sitting on a whāriki [woven flax mat] and the whāriki is wrapped around it. So the moki is our subtle recognition of the mātauranga [knowledge] that we have and how that mātauranga is wrapped with the whāriki and brings in the modern day, the technical concepts but also things from our tūpuna [ancestors].*

The philosophy of Hangarau emphasises ethical decision-making, critical thinking, and sustainability. "Just because you can make it, doesn't mean it's right" (Mātanga 1), also raised by Mātanga 5: "What's the need, as opposed to, what's the want?" Mātanga 3 concurs, saying: "You can't separate technology from the impact it has on the environment". Mātanga 4 extends in explaining that the environment is considered in conjunction with people: "You couldn't do anything without having a social conscience. You always must think about your people, basically, as Māori. Whether you're needed or not, that's how we are". Mātanga 2 explains that as a Māori Hangarau practitioner, the Māori lens shapes the decisions you would make by sharing the example of having a power dam on the banks of the Waikato River (the river being an ancestor): "You would look at some other solution in order to do what you wanted to do, to get the outcome that you wanted".

Indigenous philosophies of education often emphasise holistic approaches to learning that encompass spiritual, cultural, social, and environmental dimensions (Trinick & Heaton, 2020). A curriculum philosophy that embraces this holistic perspective promotes the integration of Indigenous knowledge systems, languages, and cultural practices across various curriculum areas. It ensures that the curriculum is coherent and interconnected, fostering students' holistic development and well-being. Hangarau emphasises a holistic approach and is not static, but a

whole creative process. It is not a standalone subject, but rather it is interconnected with other learning areas.

> *It was about every process, every system, every way of operating, of making, of developing how even society works around a technology… I got excited because I saw it was one of the best ways that we could engage children in learning. (Mātanga 4)*

Mātanga 2 extended this thinking by talking about the strong connections between Hangarau and Pūtaiao [Māori-medium Science].

> *They should be able to be taught together. To me, the main thing is about valuing mātauranga Māori [Māori knowledgebase] and all that that means. The key idea for me is about the knowledge that our tūpuna had to change and develop all the time, take on new ideas, work out what's right and what's wrong. It wasn't a magical thing. It was a clearly thought-out process.*

As noted, initially, in the inaugural development in the 1990s, there was a requirement to mirror the design of the English-medium curriculum, Mātanga 3 advocates as a starting point: "We have to decide whether we're going to accept the categories of Western divisions of knowledge". Once this decision is made, mātanga can either deliberate on the nature of Hangarau as a discipline, or they can interrogate "how Māori categorise knowledge traditionally and what it means in the contemporary world". Mātanga 2 agrees that there needs to be a more holistic approach to the curriculum: "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 [Curriculum]". This debate on what is relevant for schooling and the categories of knowledge that have relevance to schools will (hopefully) now be in the hands of the Māori communities who should be the ones deciding about the future for their next generations.

The front section of Te Marautanga o Aotearoa [TMoA] articulates the underlying beliefs, values, and theories guiding the development and implementation of TMoA. In this section, the importance of genealogical connections is emphasised, with the hope that students in Aotearoa NZ "always remember that they never stand alone" (Mātanga 1).

When talking about the second iteration of the Hangarau curriculum, or the re-design in the mid-2000s, Mātanga 3 said: "There was a genuine attempt to indigenise the curriculum [but] I don't think we were as successful as we would have liked." Each mātanga had a complementary focus when speaking of the ways in which the 2017 iteration of the Marautanga Hangarau reflects Indigenous knowledge and pedagogy. Mātanga 4 saw Hangarau as an encompassing curriculum with significant potential for cross-curriculum integration of learning, Mātanga 1 focused on its relationship with other learning areas, and Mātanga 2 on how Hangarau is strongly linked with Pūtaiao [Māori-medium Science]. Mātanga 5 focused on the decolonising nature of Hangarau, and Mātanga 3 spoke of creativity and the potential for Hangarau to enhance lives.

Hangarau is about solving problems in a practical way. "We recognised people who were good with their hands were also knowledgeable" (Mātanga 4). It is about the holistic interconnectedness of knowledge and the need to interconnect different areas of learning. It is about creative processes, critical thinking, and sustainability.

> *Even though we're still working in Pāngarau [Māori-medium Maths] and Pūtaiao [Māori-medium Science]—I think the next step really is to have no boundaries and just have a think about that broad thing about what we want our kids to know." (Mātanga 2)*

Hangarau has a whakapapa [pedigree, ancestral lines, and connections]. Mātanga 4 raised a caveat regarding the removal of the context named Tuku Mōhiohio [Information Transfer] to facilitate the addition of the Hangarau Matihiko [Māori-medium Digital Technologies] content in 2017:

> *If you name something, it has presence (and mana). If you take things out, then it loses that and then it just becomes not that important, even though it's meant to be woven through everything, do we really understand what weaving it through looks like… and has it been researched?*

Mātanga held similar views on the place of Pākehā [Europeans] or wider western ideas in relation to Hangarau. Mātanga 1 looked at Hangarau as part of the wider curriculum, where collectively "the mātauranga [knowledge] that [students] will have access to through this Marautanga, through this curriculum, will come from a Mātauranga Māori perspective and a Western worldview perspective" (Mātanga 1). Mātanga 3 identified tensions in this when looking at "the commodification of ideas or… how you capitalise on people's needs". It is about developing a hybrid of Māori and Western ideas and finding a way to include both. It involves critical analysis between pillars of knowledge and determining what is important for students to know and be able to do (Mātanga 2, Mātanga 3, Mātanga 5). It is about reclaiming and celebrating Mātauranga Māori that is being passed down through the generations. It is also about preserving and valuing Mātauranga Māori while incorporating selected Western ideas. Mātanga 4 spoke of the need to establish connections to valuable knowledge, integrating it into your knowledgebase.

Indigenous leadership in language and curriculum emphasises the significance of whakapapa, encompassing naming and framing practices. This approach fosters the empowerment of the next generation by imparting relevant, interconnected knowledge. These elements ensure that the Hangarau curriculum acknowledges and reflects Indigenous philosophies and pedagogy. The philosophy of Hangarau as it stands currently holds much of value for Māori communities. That's not to say that its boundaries couldn't or shouldn't change in the redevelopment over 2024-2025. Hangarau is currently about solving problems, meeting needs, and in so doing, improving lives. No matter how the shape of the curriculum changes, there needs to be a focus on localising the national curriculum and significant governmental support for schools to develop their own localised curriculum, which will be explored more in relation to the discussion on the implications for classroom implementation.

**Implications of Alignment on the Implementation of Hangarau**

The issue of alignment and curriculum coherence significantly impacts the implementation of curriculum and classroom practice in Indigenous schools, particularly so student learning outcomes. The lack of alignment and coherence in the curriculum can lead to confusion and inconsistency in its implementation. Teachers may struggle to integrate disparate or conflicting curriculum materials, resulting in fragmented instructional approaches. This can undermine the

effectiveness of teaching and learning in Indigenous schools, impeding students' ability to make meaningful connections between concepts and develop a deep understanding of the content.

Curriculum in Indigenous schools must reflect the cultural values, knowledge systems, and languages of the communities they serve. Lack of coherence between the curriculum and Indigenous cultural contexts can lead to cultural dissonance for students, as they may struggle to see themselves reflected in the curriculum or find relevance in the content. One of the identified tensions in Māori curriculum design is based on the creation of a national Māori identity in relation to Pākehā [Europeans]. Pre-contact, the hapū [extended family] was the political unit. As such, each hapū and their wider iwi [tribe] have their own practices, their own traditions, their own protocols. This cannot be accurately reflected in a nationally mandated curriculum (Mātanga 1, Mātanga 2, Mātanga 5; Ministry of Education, 2003-2012).

> *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. … The responsibility for implementation, teaching, evaluation needs to shift much more to the local community. …. it can't happen without considerable support from the state (Mātanga 3)*

In summary, the issue of alignment and curriculum coherence profoundly impacts the implementation of curriculum, classroom practice, and student learning outcomes in Indigenous schools. To address these challenges, it is crucial to develop culturally responsive, coherent curriculum frameworks that honour Indigenous cultural identities, promote equitable access to resources, and support meaningful engagement and learning for Indigenous students.

## Future Curriculum Alignment and Cohesion

The analysis of the dataset and the resulting discussions that were outlined briefly above have been used in the development of key recommendations to consider in the design of curriculum and its support materials for Māori-medium educators, and specifically for the Hangarau curriculum. Considering the weaknesses in curriculum coherence, it's imperative to address these issues for effective curriculum alignment and cohesion. Firstly, there is a need to address the considerable inequity in support materials that are available, particularly for teachers of students at secondary level (aged over thirteen years of age) (Ministry of Education, 1999-2000a, 1999-2000b, 1999-2003, 2003-2012, 2007-2009, 2008-2010). Providing comprehensive support materials is crucial for successful implementation of Te Marautanga o Aotearoa in Māori-medium classrooms.

Secondly, curriculum support materials should be developed bilingually and with a te ao Māori lens [a Māori worldview]. If Māori-medium is to claim the right to indigenise Hangarau (whether the boundaries of Hangarau change over 2024-2025), and other Wāhanga Ako [Learning Areas, or disciplines], then it needs to be given the opportunity and the space to develop Hangarau without its design being determined by the needs of the English-medium sector. The Māori-medium sector should determine their educational needs.

Furthermore, curriculum design for small, limited capacity communities must be flexible and tailored to their specific needs, not one size fits all. What is appropriate for the New Zealand

Curriculum should not be the reference and determine what is appropriate for Te Marautanga o Aotearoa.

If we are to consider the imbalance between demand and supply – the small pool of mātanga and Hangarau practitioners with the requisite skills and the corresponding requisite fluency in te reo Māori [Māori language] – we need to develop online materials that can be accessed asynchronously. This collective pool of resources would reduce the burden on educators to create their own materials, particularly those lacking fluency in te reo Māori.

Lastly, it's essential that theories and rationale that are being used to determine both curriculum and its support materials should be informed by systematic research in Māori-medium contexts. This research should underpin the development of both curriculum content and support materials to ensure their effectiveness and relevance within Māori-medium education.

## Initial Conclusions

In conclusion, this exploration into the coherence of Hangarau curriculum development in Māori-medium education reveals the intricate interplay between Eurocentric ideologies and Indigenous aspirations. Through insights shared by curriculum experts, the transformative power of language revitalisation efforts has been underscored, not merely as linguistic endeavours but as acts of reclaiming ancestral knowledge and restoring cultural connections. Furthermore, the call for curriculum coherence resonates not only as a pedagogical imperative but as a moral imperative rooted in self-determination. Empowering Māori-medium educators to shape Māori-medium curriculum without being bound by the dictates of the English-medium paradigm is essential for fostering authentic representation and relevance.

In navigating the complexities of curriculum development, flexibility emerges as a guiding principle. Embracing bespoke approaches tailored to the needs of diverse communities acknowledges the richness of Indigenous perspectives and challenges the hegemony of one-size-fits-all education models. Looking ahead, the path towards curriculum coherence demands collaborative efforts and visionary leadership. The recommendations put forth serve as signposts for action, urging policymakers and educators alike to embark on a journey of innovation and inclusivity. By harnessing the collective wisdom of our communities and embracing the dynamic nature of knowledge transmission, we pave the way for a curriculum that truly reflects the aspirations and values of Aotearoa NZ's diverse Māori-medium educational contexts.

In closing, let us heed the wisdom of our ancestors and the aspirations of our tamariki [children]. Let us strive not only to teach but to empower, not only to transmit knowledge but to nurture wisdom, and not only to preserve culture but to cultivate its flourishing. In doing so, we honour the past, embrace the present, and forge a brighter future for generations to come.

## References

Allen, P. (2023). *Uruuru whenua: Using cultural symmetry to rebalance mātauranga and school mathematics.* (Doctoral thesis, University of Auckland). https://hdl.handle.net/2292/65818

Allen, P., Wall, M., McKenzie, T., & Trinick, T. (2022). *How ākonga-centred pedagogical approaches have been situated in national curricula for Māori throughout two eras.* [An unpublished literature review for the Ministry of Education.]

Benton, R. (1979). *Who speaks Māori in New Zealand?* NZCER.

Bialystok, E. (2017). The bilingual adaptation: How minds accommodate experience. *Psychological Bulletin, 143*(3), 233–262. https://doi.org/10.1037/bul0000099

Boroditsky, L. (2001). Does language shape thought? Mandarin and English speakers' conceptions of time. *Cognitive Psychology, 43*(1), 1-22. https://doi.org/10.1006/cogp.2001.0748

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Charlemagne. (n.d.). *Language, second, soul.* https://www.allgreatquotes.com/quote-89260/

Chen, M. K. (2013). The effect of language on economic behavior: Evidence from savings rates, health behaviors, and retirement assets. *American Economic Review, 103*(2), 690-731. http://dx.doi.org/10.1257/aer.103.2.690

Cook, V. (2008). *Second language learning and language teaching* (4th ed.). Hodder Education.

Education Counts. (2023). *Māori language in schooling.* Ministry of Education. https://www.educationcounts.govt.nz/statistics/maori-language-in-schooling

Fullan, M. (2007). *The new meaning of educational change* (4th ed.). Teachers College Press.

Guest, G., MacQueen, K. M., & Namey, E. E. (2012). *Applied thematic analysis*. SAGE. https://doi.org/10.4135/9781483384436

Harrison, K. D. (2010). A world of many (fewer) voices. *When languages die: The extinction of the world's languages and the erosion of human knowledge, Oxford Studies in Sociolinguistics*, 3-22. https://doi.org/10.1093/acprof:oso/9780195181920.003.0001

Hemara, W. (2000). *Māori pedagogies: A view from the literature*. NZCER.

Hetaraka, M. (2022). Myth-Making: On-going impacts of historical education policy on beliefs about Māori in education. *New Zealand Journal of Educational Studies, 57,* 321-333. https://doi.org/10.1007/s40841-022-00257-0

Jones, A., & Jenkins, K. (2011). *He kōrero- Words between us: First Māori-Pākehā conversations on paper.* Huia.

Kramsch, C. (2014). Language and culture. *AILA Review, 27*(1), 30-55. https://doi.org/10.1075/aila.27.02kra

Lemon, R. (2019). *Rangahau Hangarau: Stories of curriculum development.* (Master's thesis, University of Auckland). ResearchSpace. http://hdl.handle.net/2292/46957

Lemon, R. (2023). Professional learning opportunities for the Hangarau Māori-medium Technology curriculum. *The 40th International Pupils' Attitudes Towards Technology Conference Proceedings 2023, 1*(October). https://openjournals.ljmu.ac.uk/PATT40/article/view/1399

Lemon, R., & Durham, R. (2017). *Hohi 1816.* https://cybersoul.co.nz/hohi1816.html

Lemon, R., Lee, K., & Dale, H. (2020). The marau Hangarau (Māori-medium Technology curriculum): Why there isn't much research but why there should be! *Australasian Journal of Technology Education, 6*. http://doi.org/10.15663/ajte.v0i0.71

Lemon, R., Trinick, T., & Lee, K. (2023). Challenges and opportunities in the indigenisation of the Marautanga Hangarau (the Māori-medium technology curriculum): Indigenous knowledge and an emerging philosophy of Hangarau. *Australasian Journal of Technology Education, 9*. https://doi.org/10.15663/ajte.v9.i0.91

Maxwell, P., & Ngata, W. (Executive Producers). (2011, Sep 5). *Māori oriori or lullabies* [YouTube channel - wakahuiatvnz]. https://youtu.be/00Og1nd9_Hc

Maxwell, P., Ngata, W., & Douglas, M. (Executive Producers). (2022, Oct 27). *Waka Huia – Broughton Johnson full episode* [YouTube channel - wakahuiatvnz]. https://youtu.be/4JkeTr_tmAA

May, S., & Hill, R. (2018). Language revitalization in Aotearoa/New Zealand. In L. Hinton, L. Huss, & G. Roche (Eds.), *Routledge handbook of language revitalization* (pp. 309-319). Routledge. https://doi.org/10.4324/9781315561271

McKenzie, T. & Toia, R. (2022). An inclusive indigenous approach to curriculum development, *International Journal of Inclusive Education*, 1-15. https://doi.org/10.1080/13603116.2022.2127493

McMurchy-Pilkington, C., Trinick, T., & Meaney T. (2013). Mathematics curriculum development and indigenous language revitalisation: Contested space. *Mathematics Education Research Journal, 25*(3), 341-360. https://doi.org/10.1007/s13394-013-0074-7

Ministry for Culture and Heritage. (2023). *Read the Treaty*. https://nzhistory.govt.nz/politics/treaty/read-the-treaty/english-text

Ministry of Education. (1995). *Technology in the New Zealand curriculum.* Learning Media.

Ministry of Education. (1999). *Hangarau i roto i Te Marautanga o Aotearoa.* Learning Media.

Ministry of Education. (1999-2000a). *Various policy and operational papers CU17/719/5; CU17/812/5; CU17/969/5: Māori Education – PLD; Hangarau 2000.* Request for official information 1242781.

Ministry of Education. (1999-2000b). *Various policy and operational papers CU17/970/5; CU17/971/5: Teacher Development Māori Education – Te Tihi; Haemata Ltd.* Request for official information 1223652.

Ministry of Education. (1999-2003). *Various policy and operational papers CU17/719/5; CU15/755/5: Ngā tauaromahi; Hangarau video.* Documents released under request for official information 1100564.

Ministry of Education. (1999-2008). *Various policy and operational papers CU17/812/5; CU15/2227/5; CU17/846/5; 1999 Hangarau implementation; 2006 marau redevelopment.* Documents released under request for official information 1139624.

Ministry of Education. (2003-2012). *Various policy and operational papers CU17/1530/5; CU17/5461/5; 2003 Whakapiki Reo Hangarau PLD; 2011 Beacon Practice Hangarau Scoping Project.* Documents released under request for official information 1214766.

Ministry of Education. (2007-2009). *Various policy and operational papers CU15/3237/5; CU15/344/5; Te Raweke Ira; NAMSATT*. Documents released under request for official information 1118980.

Ministry of Education. (2008). *Te Marautanga o Aotearoa.* Learning Media.

Ministry of Education. (2008-2010). *Various policy and operational papers CU15/3888/5; CU15/3888/5; Māori Medium Materials Development – Tūhuratia te Ao Hangarau.* Request for official information 1207583.

Ministry of Education. (2010-2011). *Various policy and operational papers CU15/4974/5; CU15/5167/5; Reprint of Hei Tautoko i te Hangarau – Reprint of Tūhuratia te Ao Hangarau.* Request for official information 1241126.

Ministry of Education. (2017a). *Te Marautanga o Aotearoa.* Learning Media.

Ministry of Education. (2017b). *The New Zealand Curriculum.* Learning Media.

Ministry of Education. (2021). *He Tamaiti Hei Raukura.* https://www.kauwhatareo.govt.nz/assets/Uploads/689950af53/He-Tamaiti-Hei-Raukura_Paper_.pdf

Nippert, H. (2021). *Determining the NCEA Level 1, 2, and 3 subject lists for Te Marautanga o Aotearoa* [Report version 1.5 from Review of Achievement Standards Project]. https://ncea-live-3-storagestack-53q-assetstorages3bucket-2o21xte0r81u.s3.amazonaws.com/s3fs-public/2021-06/Technical%20Report%20TMoA.pdf?VersionId=DV_LCpf0dqR2BeROrkVHghISsckS_Nuo

O'Malley, V., & Harris, A. (2017). *He Whakaputanga: The Declaration of Independence, 1835.* Bridget Williams Books. https://doi.org/10.7810/9781988533032

O'Regan, H. (2018). *Tō reo ki te raki, tō mana ki te whenua* [uLearn18 | keynote video]. https://youtu.be/N-NsHycKX3Q

Petrie, H. (2006). *Chiefs of industry: Māori tribal enterprise in early colonial New Zealand.* Auckland University Press.

Pōhatu, T., Anderson, M., Goulton, F., Murphy, H., Rau, C., Newbold, E., Brewerton, M., Savage, R., Hohepa, M., White, H., Hawkesworth, L., & Wehipeihana, N. (2014). *Rukuhia, rarangahia. Aromatawai: Ministry of Education position paper.* https://tmoa.tki.org.nz/Mataiako/Rukuhia-Rarangahia

Riini, M. & Riini, S. (1993). *Pāngarau – Māori mathematics and education*. Ministry of Māori Development.

Roach, A., Niebling, B., & Kurz, A. (2008). Evaluating the alignment among curriculum, instruction, and assessments: Implications and applications for research and practice. *Psychology in the Schools 45*(2), 158–176. https://doi.org/10.1002/pits.20282

Royal, T. A. C. (2019). *Mātauranga Māori: An introduction.* A 'think piece' report. Ministry of Education.

Saldaña, J. (2022). *The coding manual for qualitative researchers* (4th ed.). SAGE.

Sapir, E. (2002). In J. T. Irvine (Ed.), *The psychology of culture: A course of lectures* (2nd ed.). Mouton de Gruyter.

Simon, J. (1992). European style schooling for Māori: The first century. *Access: Contemporary Issues in Education, 11*(2), 31–43. https://pesaagora.com/access-archive-files/ACCESSAV11N2_077.pdf

Simon, J., & Smith, L. T. (Eds.). (2001). *A civilising mission? Perceptions and representations of the New Zealand native schools' system*. Auckland University Press.

Skerrett, M. (2019). Colonialism, Māori early childhood, language, and the curriculum. In E. A. McKinley & L. T. Smith (Eds.), *Handbook of Indigenous education* (pp. 483-504). Springer. https://doi.org/10.1007/978-981-10-3899-0

Spolsky, B. (2005). Māori lost and regained. In A. Bell, R. Harlow, & D. Starks (Eds.), *Languages of New Zealand* (pp. 67-85). Victoria University Press.

Stewart, G. (2020). *Māori philosophy: Indigenous thinking from Aotearoa*. Bloomsbury Academic.

Stewart, G. T., & Tocker, K. (2021). Te tupu o te rākau: Stages of Māori medium education. *WINHEC: International Journal of Indigenous Education Scholarship, 16*(1), 113-141. https://doi.org/10.18357/wj161202120277

Sullanmaa, J., Pyhältö, K., Pietarinen, J., & Soini, T. (2021). Relationships between change management, knowledge sharing, curriculum coherence and school impact in national curriculum reform: A longitudinal approach. *International Journal of Leadership in Education*, 1-25. https://doi.org/10.1080/13603124.2021.1972165

Te Pae Roa. (2022, April). *The future of Kaupapa Māori and Māori medium education* [Report]. https://assets.education.govt.nz/public/Documents/our-work/information-releases/Issue-Specific-release/Grow-Maori-Medium/The-Future-of-Kaupapa-Maori-and-Maori-medium-education-Te-Pae-Roa-April-2022.pdf

Te Pae Roa. (2022, Jul-Aug). *Supporting Māori medium education and growing Kaupapa Māori education* [Report]. https://assets.education.govt.nz/public/Documents/our-work/information-releases/Issue-Specific-release/Grow-Maori-Medium/Te-Pae-Roa-Final-Report.pdf

Te Rua Mahara o Te Kāwanatanga: Archives New Zealand. (n.d.). *Who were the rangatira who signed He Whakaputanga?* https://www.archives.govt.nz/discover-our-stories/who-were-the-rangatira-who-signed-he-whakaputanga

Thomas, D. R. (2006, June). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation, 27*(2), 237-246. https://doi.org/10.1177/1098214005283748

Toia, R. (2021, May 11). An ākonga centred curriculum. *PPTA Education Conference 2021 keynote* [Video]. https://youtu.be/Z6heilP-PWY?si=d-k7APLGvE2QCTZh

Trinick, T. (2015). Enhancing student achievement: School and community learning partnership. *American Journal of Educational Research, 3*(2), 126–136. https://doi.org/10.12691/education-3-2-4

Trinick, T., & Heaton, S. (2020). Curriculum for minority Indigenous communities: Social justice challenges. *Language, Culture and Curriculum, 34*(3), 273-287. https://doi.org/10.1080/07908318.2020.1831009

Trinick, T., & May, S. (2013). Developing a Māori language mathematics lexicon: Challenges for corpus planning in indigenous language contexts. *Current Issues in Language Planning, 14*(3-4), 457-473. https://doi.org/10.1080/14664208.2013.835149

Trinick, T., Fisher, M., & Parangi, J. (2022). *The complex interrelated factors that influence why and how the learning of content is organised and sequenced in curricula.* [An unpublished literature review for the Ministry of Education.]

Wenzel, A. (2016). Curriculum alignment. In S. Mertens, M. Caskey & N. Flowers (Eds.), *The encyclopedia for middle grades education* (2nd ed., pp.112–115). Information Age.

Whorf, B. (1956). In J. B. Carroll (Ed.), *Language, thought, and reality: Selected writings of Benjamin Lee Whorf.* MIT Press.

Wright, M. (2019). *Waitangi: A living treaty.* Bateman Books.