

Professional Learning Opportunities for the Hangarau Māori-medium Technology Curriculum

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ABSTRACT

This paper is the third in a series of papers exploring the development of the Māori-medium Technology curriculum, specifically focusing on professional learning development. It utilises document analysis and interviews with curriculum experts, drawing on curriculum alignment and coherence theories. Curriculum coherence affects student learning across various levels: national, subject, school/classroom, and systems. Data comes from Ministry of Education records and interviews with teacher professional development facilitators. The study reviews professional learning literature, particularly meta-analyses and reviews, in the context of curriculum coherence. It examines how curriculum coherence relates to the professional development needs of teachers implementing the Hangarau curriculum, highlighting the challenge of interpreting broad learning outcomes. The paper suggests principles for aligning national curriculum content and professional learning, aiding facilitators and teachers in designing effective professional development for improved student learning.

Key Words: Hangarau, Māori-medium Technology, curriculum coherence, indigenous Technology, Technology curriculum.

1. INTRODUCTION AND CONTEXT

Internationally, the field of education has witnessed significant changes in the conceptualisation and implementation of professional learning over the past few decades (Alton-Lee, 2017; Ewing, 1970; Murphy et al., 2009; Wylie, 2012). New Zealand's political and education system is generally highly influenced by international trends including how professional support is provided to teachers, particularly so in the past 30 years. For example, prior to the 1980s, there was no centralised model for providing professional learning to teachers in support of government education initiatives. In-service training, as it was known then, was a voluntary in-service training system that aligned with a cascade approach (Timperley et al., 2007). Various forms of training were available, such as seeking assistance from a limited number of advisors, utilising video services that demonstrated pedagogical approaches, or participating in collaborative development at Lopdell House (NZCER, 2013; Wylie, 2012).

External experts trained school leaders who then disseminated the learning to teachers within their schools. However, this model gradually evolved into a coaching and mentoring approach (Robertson & Murrphy, 2006), where selected teachers received external training and then shared their knowledge with colleagues upon returning to their schools.

Internationally, during the 1980s and 1990s, the narrative associated with in-service training underwent a transformation, highly influenced by neoliberal ideology (Wylie, 2012) with professional development and professional learning becoming the preferred terms (Ministry of Education [MoE], 2023; OECD, 2022). The shift towards neoliberalism brought about changes in the way teacher professional development was conceptualised, funded, and delivered. Neoliberalism encouraged a more targeted approach to professional development. Schools were expected to identify their specific needs and invest in professional development programs that directly addressed those needs (Lee, 2000). This shift reflected a broader understanding of professional growth, emphasising continuous learning, collaborative engagement, and empowering educators to take ownership of their development (Bonne & Wylie, 2017; Timperley et al., 2007). Funding for teacher professional development became increasingly tied to a schools' performance outcomes, with a focus on demonstrating improved student achievement (Day et al., 2016)

The change in terminology also highlighted the recognition that professional growth encompasses both the acquisition of new skills and knowledge and the development of attitudes, beliefs, and values that support effective teaching and learning (O'Brien & Jones, 2014). These changes were driven by advancements in educational research, infrastructure, and policy, leading to a decentralised approach to professional development in New Zealand, where individual schools took responsibility for supporting their teachers' professional growth (Education Act 1989; Lee, 2000; Rishworth, 1996).

The professional development model(s) and policies which have underpinned schooling in New Zealand generally have also been applied to Māori-medium schooling, despite the considerable capacity differences between the two models (Lemon et al., 2020, 2023). For example, there has been a transition toward centralising the funding and prioritisation of professional learning at a national level (MoE, 2023), still optional, not mandatory (OECD, 2022). Consequently, this transition has created a tension between a centralised approach driven by national policies and the need for personalised learning to meet local and diverse learner needs. This issue of balancing standardisation and customisation forms the problem space for this study, specifically focusing on lack of support of professional development for the Māori-medium schooling sector to support the successful implementation of the hangarau curriculum. This points to the lack of understanding at the policy level of curriculum coherence. Curriculum coherence refers to the alignment and consistency within a curriculum framework or across different components of an educational system (Sundberg, 2022). It ensures that the various elements of curriculum, such as goals, content, assessment, and instructional strategies, are logically interconnected and work together effectively to support student learning. The concept of curriculum coherence is important in providing a unified and meaningful educational experience for students. There are several levels of curriculum coherence, each addressing different aspects of the curriculum. The level of concern to this paper is the implementation of curriculum via professional learning. Curriculum implementation concerns the enactment of the curriculum in classrooms (Lemon, 2019; Lemon

et al., 2023; McMurchy-Pilkington, 2008) The alignment between curriculum objectives and instructional practices is crucial for successful implementation (Wiggins & McTighe, 2005). This paper argues that curriculum coherence has not been fully achieved in supporting the implementation of the hangarau curriculum. Thus, its implementation has been extremely variable across the country. This paper proposes a theoretical framework to address curriculum coherence issues in Māori-medium schooling that may have applicability to other minority indigenous communities.

The methodology will be briefly outlined, followed by the discussion of a framework that presents an initial set of principles that support curriculum implementation for indigenous Māori-medium schools and recommendations for further research. By addressing the issue of curriculum coherence, this study aims to contribute to the improvement of professional learning practices in Māori-medium contexts and potentially other similar marginalised indigenous language education contexts.

The main research question for this paper focuses on the relationship between the indigenous philosophy of Hangarau and Professional Development for Māori-medium schools. This paper also explores the place and role of indigenous Māori knowledge in Hangarau. What are the ways in which the content, design and structure of professional development opportunities acknowledge, and reflect indigenous knowledge, and pedagogy of the marau (curriculum)? What are the implications these concepts have on classroom implementation and the enactment of the marau Hangarau?

2. BACKGROUND

Technology is a relatively new discipline in schooling, having emerged as a standalone subject in the 20th Century (Jones & De Vries, 2009), thus, much of the literature on professional learning is more generalised. However, the definitions of professional learning are diverse, ranging from: professional learning development; continuing professional development; teacher development; in-service education and training; staff development; career development; continuing education; to lifelong learning. The broadest definition posits that professional learning incorporates “any experience of educator learning” (Netolicky, 2020, p.5) “during the course of a career” (Day & Sachs, 2004, p.3), including both formal and informal learning opportunities (Bolam & McMahon, 2004; Bubb & Earley, 2007; Day, 1997; Earley & Porritt, 2010). Researchers have extended this definition by including the notion of design, that these professional learning experiences have been crafted and differentiate between traditional and innovative delivery of these learning experiences (van Veen et al., 2012). In contrast, other definitions focus on the need for this learning to have a positive impact on students in the classroom (Scales et al., 2011). In the New Zealand context, Wylie (2012) traces the common usage of the term – in-service education, to professional learning, to professional development, as carrying within the term an evolving notion as to the nature of what it means to be a professional engaging in on-going learning.

As with the definitions of professional learning, there are a range of categories or types of professional learning models and/or frameworks that have been identified in the literature.

Notable are, the exploration of functions (extension, renewal and growth) and drivers (systemic and personal) of professional learning in the Australian context (Grundy & Robison, 2004); the identification of a baseline to facilitate the measurement of impact in continuing professional development in London (Earley & Porritt, 2010).

One of the issues that has underpinned professional learning is the issue of focusing on deficit learning and/or thinking (Netolicky, 2020; van Veen et al., 2012). Deficit thinking, also known as a deficit perspective or mindset, is primarily associated with education and professional development. It refers to a negative and limiting approach that focuses on identifying and addressing the weaknesses, shortcomings, and deficiencies of individuals, especially students or professionals, rather than recognising and building upon their strengths and assets. Approaches based on deficit thinking tend to be reactive and focused on remediation rather than prevention and proactive development. This can result in temporary fixes that don't address the root causes of issues. To address these issues, it's important for educators, trainers, and professionals to shift their mindset from a deficit perspective to an asset-based perspective. This involves recognising and valuing the diverse strengths and assets that individuals bring to the table, fostering a growth mindset, and providing support and resources to help individuals reach their full potential. An asset-based approach can lead to more inclusive, motivating, and effective learning and professional development experiences.

A more specific tension lies in the scarcity of professional learning opportunities that are targeted to the Māori-medium context in Aotearoa (Marshall & McKenzie, 2011; Murphy et al., 2009). A 'one size fits all' approach has resulted in English-medium content being delivered with Māori-medium practitioners and a majority of research that is conducted with a focus on the New Zealand Curriculum (Alton-Lee, 2017; Bonne & Wylie, 2017; Hipkins & McDowall, 2020; Timperley et al., 2007). There is the associated need for a significant increase in the support given to Māori-medium teachers, in terms of second language acquisition theories and pedagogies (Marshall & McKenzie, 2011; Matamua, 2012).

3. METHODOLOGY: CURRICULUM ALIGNMENT THEORY

This section provides an overview of the research methodology and the data 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; Lemon et al., 2022). This paper concentrates on professional learning in relation to the implementation of the hangarau curriculum.

As argued, curriculum coherence is critical because it enhances the quality of education, improves student learning experiences, and supports educators in their instructional efforts (Sullanmaa et al., 2021). It aligns curriculum components, ensures a logical progression of content and skills, and ultimately contributes to the overall effectiveness and equity of the education system. Curriculum coherence underpinned by curriculum alignment theory emphasises the importance of aligning curriculum components such as learning objectives, instructional materials, teacher professional development and assessments to ensure a cohesive and integrated educational experience. It helps to reduce the disruptions between the intended process and the actual process (Wenzel, 2016). Roach et al. (2008) defined alignment as "the extent to which curricular

expectations and assessments agree and work together to provide guidance for educators' efforts to facilitate students' progress toward desired academic outcomes" (p.160). This implies that curriculum alignment plays a large role in ensuring consistent and robust curriculum delivery across the school, thereby improving the quality of students' school experience.

3.1. Method

There were two sources of data. The first was secondary data collection which involved a series of information requests to the MoE under the Official Information Act 1982. The MoE is the agency primarily responsible for teacher professional development in New Zealand. The Professional Learning Development (PLD) documents (both first and second tier) covered in the dataset included: Contracts; schedules of payment; milestone reports; discussion documents; workshops; cluster meetings' minutes; surveys; school submissions and proposals (MoE, 1999-2000a; 1999-2000b; 1999-2003; 1999-2008; 2003-2012; 2007-2009; 2008-2010). Several PLD projects that were documented included a range of PLD opportunities, between 1999 and 2012, that embody key thinking about PLD at that time.

The second data source were interviews with experts, or *mātanga* who were involved in the development and/or implementation of the Hangarau curriculum. In the indigenous Māori context, *mātanga* are considered experts in a particular field. In this case, it refers to experts with a teaching background, who have worked in 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 these disciplines. The *mātanga* that agreed to participate chose a time and location that was convenient for them. The semi-structured interviews were approximately an hour in duration. The interviews were recorded and transcribed prior to coding and analysis.

Interviews were conducted with the five *mātanga*. Their views of the development of the Hangarau curriculum (MoE, 1999, 2008, 2017a) with respect to the development of professional development and learning opportunities for educators are discussed after the *mātanga* are introduced below.

Mātanga tuatahi (M1) from Northland, was given responsibility for the management of the re-design of Te Marautanga o Aotearoa in 2004. M1 had over a decade of teaching experience within Māori-medium settings that informed M1's practice. M1 has led capability training and the design of curriculum support materials for 18 years. *Mātanga* tuarua (M2) from Northland initially worked as part of the team writing the Science curriculum in the 1990s. M2 led the development of the inaugural Hangarau document in the 1990s and has since transitioned to focusing on work in curriculum design, PLD and the development of curriculum support materials to the Marautanga Pūtaiao (Māori-medium Science Curriculum). *Mātanga* tuatoru (M3) from the East Coast 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, M3 led the re-development of the front section of Te Marautanga o Aotearoa and worked across the curriculum

in the standardisation of the lexicon. All these mātanga are involved in the curriculum refresh which started in Aotearoa-NZ in 2021.

Mātanga tuawhā (M4) from Taranaki and Wellington, was initially part of the curriculum development team for the Technology curriculum (commonly known as the choccie doccie) before joining the writing team for Hangarau. M4 worked as a Hangarau Facilitator before working as a kura kaupapa Māori principal for the next 22 years. Mātanga tuarima (M5) from Hawke’s Bay has been involved in Hangarau as a PLD facilitator, a regional coordinator and as a designer of second tier (or curriculum support materials), since 2000. M5’s focus has been on ensuring that there are resources that classroom teachers can use in their exploration of and engagement with the Hangarau curriculum. M5 was a member of the reference group in the addition of the Hangarau Matihiko (Māori-medium Digital Technologies) content to the Hangarau curriculum (MoE, 2017a).

3.2. Coding and data analysis

The dataset, the documents and the interviews, were coded and analysed using in-vivo coding (not the application NVivo, the concept of drawing out the codes where they lie, using the words of the dataset to define the codes) for the first-cycle of coding, and then focused coding for the second-cycle of coding (Saldaña, 2022). Analysis was conducted through an adapted approach to thematic analysis (Braun & Clark, 2006; Guest et al., 2012; Thomas, 2006). The findings have been summarised very briefly in the next section.

4. KEY FINDINGS

Initial in-vivo codes were generated for the complete dataset, then a second cycle of focused coding was conducted. An outline of the synthesis in relation to Professional Learning Development (PLD) is discussed below. Table 1 shares an outline of the key Hangarau PLD opportunities that were detailed in the documents and then each of the following notions identified as being a significant notion related to PLD from the dataset is outlined briefly.

Table 1
Key Hangarau PLD Opportunities

Date/Year	Region	Participants	Professional Learning Development description	Request #
1998-2000	National, school-based with facilitators working with 4-5 kura at a time.	114 teachers participated in the PLD run by Massey University in 1998.	3 contracts (1 year initially, but extended to 2 years) including a range of PLD opportunities.	1214766, 1223652 and 1207583

Nov 17-19, 1999	National 3-day hui convened at a hotel in Rotorua	40 participants from multiple schools	National Hangarau conference: seven keynote speakers and four workshop sessions.	1139624
2000	Auckland/ Northland regions	Whānau attended with teachers, due to the central role that family play in kura kaupapa Māori.	Series of wānanga and night hui run by Te Haeata Trust, implementing two proposed models of staggered delivery, with in-class support.	1223652
2000-2001	Waikato and Northland	4 schools in each region.	Series of hui and in-school support, coordinated by Te Tihī Ltd.	1214766
2003-2005	Targeting teachers from different regions in each iteration of the programme.	10 teachers accepted into each block. Two extra places available for Resource Teachers of Māori and Māori Advisers.	Te Whakapiki Reo Hangarau: An intensive 20 week programme providing curriculum support in hangarau, delivered in the medium of te reo Māori. Content included second language acquisition strategies, curriculum coverage, and assessment practices for hangarau.	1214766 and 1207583
2012-2013	14 kura across four clusters: Northland, Waikato, Central North Island, East Coast.	Initial scoping completed, but project was not completed.	Beacon Practice Technology Project phase three aimed to include Hangarau in providing in-school coaching, modelling and mentoring to enhance classroom practice.	1214766

Prior to the inaugural development in the 1990s, there was a significant paucity of research which examined the development and implementation of Hangarau. This meant that curriculum developers and professional development facilitators did not have a research base to inform their decisions (Mātanga 1, 3; 4, 5; MoE, 1999-2000a; 1999-2000b; 1999-2003; 2003-2012). This significantly impacted on the design of the first Hangarau curriculum development, particularly in the 1990s when by default the Māori-medium version was a translation of the English-medium version. However, the paucity of research was addressed in the second iteration when the need for research was recognised and written into the contracts for the curriculum developers working towards the second iteration of Hangarau, although the existing literature had been written for the Technology curriculum (Mātanga 2; 5; MoE, 1999-2000b; 1999-2008; 2003-2012). Finally, it impacted on the development of PLD opportunities: in the 1990s, the cascading model (Timperley et al., 2007) was the most common model being implemented, with teachers being withdrawn to experience the learning, and then returning to their schools to share their learning and include it in their classroom practice (Mātanga 1; 4; 5; MoE, 1999-2000a), also referred to as the Individual Teacher Model (MoE, 1999-2000b). Aside from the challenges of being the sole teacher at that school that had learning to bring back and share with your colleagues – the PLD facilitators were also challenged in trying to ascertain the best content to deliver. It was not long until professional

learning was being designed to run in schools, the whole school development approach, and allow for peer mentoring and teaching utilising more of a wānanga (the advancement of knowledge, development of intellectual independence, and application of knowledge regarding Māori traditions according to Māori customs) approach (MoE, 1999-2000a; 1999-2000b). By 2012, the whole-school coaching, modelling, mentoring approach had been identified as a potentially effective model for Māori-medium, although it was also noted that it had been 8-10 years since some teachers had engaged with any PLD around Hangarau (MoE, 2003-2012).

4.1. Summary of key findings

There were five key findings that have been outlined in this section: The relationship between PLD and teacher retention; between the small pool of experts and discerning whether facilitator concerns are shared more widely; the imbalances in the sector, with more working at lower levels of the curriculum, and more females than males delivering hangarau content; language acquisition as a key focus of PLD; and the importance of developing tailored PLD for teachers engaging with the Hangarau curriculum.

First, Ogilvy (2012) analysed the 2000-2011 payroll data and found that 70% of Māori-medium teachers were leaving the class within their first three years as opposed to 30% of English-medium teachers (although the former may potentially be a higher figure) which is of considerable concern. Early career teachers bring fresh perspectives, enthusiasm, and up-to-date training to the profession. When they leave prematurely, schools lose valuable talent and expertise that could have contributed to the improvement of education. Teacher stability is linked to the quality of education. Schools with a stable and experienced teaching staff often perform better academically and provide a more positive learning environment. The only way to identify Māori teachers is by looking for those teachers that are paid a MITA or Māori Immersion Teacher Allowance, which is a scheme that teachers need to enrol into). Simple solutions were proposed in the dataset, ranging from simple acknowledgement through regular contact, either in the form of an email or a quick phone call (MoE, 1999-2003) to exploring ways in which the development of curriculum support materials could be developed as part of a proposed PLD programme (Mātanga 1; MoE, 1999-2000a; 2003-2012). A retention pilot programme (Wehipeihana et al., 2018) found that, with the appropriate supports built in to support beginning teachers, there was a marked improvement in retention, with only 20% of teachers leaving the classroom within the period in which these pilot programmes were running. A submission to Professional Learning Aotearoa New Zealand from Māori-medium PLD providers (2014) shared that they were experiencing much higher losses with the schools they were engaging with – as 70% of provisionally registered teachers were leaving Māori-medium schools by their third year of teaching, which confirms that this issue, although variable, is ongoing. The findings of Wehipeihana et al., 2018, suggest that PLD can be used as a supporting mechanism, particularly for beginning teachers.

Second, the small pool of hangarau support people makes it difficult to tell whether facilitator concerns are representative / shared nationally (Mātanga 3; 4, 5; MoE, 1999-2003). This tension holds true when considering the development of curriculum support materials, or the development and implementation of Professional Learning opportunities. It is also difficult to ensure that the appropriate expertise is available for the duration of the project as there is a very small pool of experts with the appropriate discipline knowledge and associated language competence (Mātanga

1; 2; 3; 5; MoE, 2003-2012; 2007-2009; 2008-2010). Creative solutions have been applied across the board – where colleagues share the load, transferring the role of lead writer briefly, to ensure deadlines are met (Mātanga 5; MoE, 1999-2008). It is also noted that it is important in any development for Hangarau, that it is important to name the whakapapa or genealogical connections of all of the mātanga, as this will define the contexts in which the development is happening (MoE, 2003-2012).

Third, it is difficult to find practitioners working across the various curriculum levels, particularly levels 5-8 (secondary school, students aged 13-18 years). Again, this is across the board, including the tauaromahi or exemplars project (Mātanga 4; 5; MoE 1999-2003), the raweke ira curriculum support materials (MoE, 2007-2009), and other support materials aimed at levels 5 and 6 of the curriculum (Mātanga 1; Mātanga 2; Mātanga 3; MoE, 1999-2008; 2008-2010). There is also a gender imbalance (Mātanga 1; Mātanga 5; MoE, 1999-2003), with larger numbers of female practitioners available, resulting in two key impacts – the imbalance in societal representation; and the tendency for women to not work with drills and lathes.

Fourth, and related to one of the key goals across Māori-medium educational contexts, that of language revitalisation. The language associated with the Hangarau curriculum is important. Curriculum support resources (MoE, 1999-2003; 2007-2009) and PLD opportunities (Mātanga 1; Mātanga 3; Mātanga 5; MoE, 1999-2000a; 1999-2000b; 2003-2012) need to consider the language that is being used and what supports are needed to ensure that both teachers and students will be able to engage with the language in the classroom context. With the advent of kura-ā-iwi (tribal schools) in 2011, there is an accompanying recognition of the importance of dialectal language and localised knowledge.

Fifth, the concept of mana ōrite or equal status is fairly new, and the disparity between the budget allocation for Māori-medium as opposed to English-medium has not been completely negated. There is less time, less money, and less resourcing generally for Māori-medium teams that are meeting the same outcomes as their English-medium counterparts (MoE, 1999-2003; 2008-2010; Mātanga 2; Mātanga 4; Mātanga 5). If the aims expressed in various policy documents (MoE, 2013; Te Puni Kōkiri, 2019) are to be realised, it will need to be resourced. The sector cannot grow until it can become a first choice for any Māori whānau in the country. This tension has contributed directly to potentially successful PLD programmes finishing early (Mātanga 2; MoE, 2003-2012) – how can we ensure that when working with English-medium colleagues, that a balance is maintained – that mana ōrite is honoured and that Māori-medium components do not become second-grade citizens of the complete PLD package? It is important to note here, that the intentions appear to have been honourable:

R_____ advised that the implementation of the Beacon Practice Phase 3 Hangarau project (particularly given the way hangarau tends to be integrated in a range of other learning areas from years 1-13), needs to be tailor-made to suit Māori medium contexts. Because the needs and contexts of English and Māori medium (including the curriculum documents) are quite different, R_____ advised that separate strands for each medium would be best. (p.2, doc 8 of series)

In Schedule 1 where the description of services is being outlined by the MoE, it continues:

The initial scoping work (covered by this contract) is intended to identify if a BPH project should be undertaken and provide guidance on how a BPH project should be undertaken, should it be conducted. The scoping exercise will look at ways to help grow the quality of student learning experiences in hangarau through providing support that is tailor-made to suit Māori medium contexts. (p.3, doc 9A of series).

5. DISCUSSION: SOME INITIAL PRINCIPLES FOR HANGARAU PLD DESIGN

The principles outlined in this section were developed as a result of the important considerations identified in the literature. Particularly significant are the ideas that professional learning should originate from an assets-based perspective and the call to address the scarcity of professional learning that has been developed specifically for the Māori-medium educational context (Marshall & McKenzie, 2011; Murphy et al., 2009). The analysis of the dataset and the resulting five notions that were outlined briefly above have been used in the development of key principles to consider in the design of professional development for Māori-medium educators, and specifically for the Hangarau curriculum. The initial principles are as follows:

- (i) Professional learning for small limited capacity communities should be bespoke, not one size fits all. A lot of the content currently being delivered to Māori-medium educators is not targeting Te Marautanga o Aotearoa.
- (ii) Needs to be strength-based not deficit.
- (iii) Professional learning should be delivered bilingually and should be designed using a te ao Māori lens (Murphy et al., 2009). If Māori-medium is to claim the right to indigenise Hangarau, 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.
- (iv) A lot of the literature identified principles that could be helpful – if applied in specific ways. i.e., longer periods of time are helpful, as they allow professionals time to engage with the new thinking. Professional learning needs to be differentiated, looking at appropriate delivery mechanisms – andragogical approaches as an example – because the development is being delivered to adult learners (Knowles et al., 2020), allowing for co-construction of development aims, buy-in and engagement from the teachers choosing to engage with this specific opportunity. There has been a move from a cascade approach, coaching and mentoring, to acknowledging the important of a community of learners, that may transcend the single school unit.
- (v) There needs to be a balance of formal and informal opportunities, where there is the opportunity to discuss, model, observe, be active in knowledge-building, where teachers get the opportunity to take what they've learnt, practice it with their students, and then return to the group, sharing their feedback and feedforward: How did the innovation work in their classroom? What could they do to further innovate with their students?

- (vi) Current teachers require training, as do the next generation of teachers, and teachers returning to the sector from overseas or a break in teaching, therefore, PLD must be ongoing.
- 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 – we need to develop online materials that can be engaged with asynchronously, or that kāhui ako (learning clusters, groups of schools that are generally geographically close to each other, that can choose to work together in collaborative professional learning opportunities) can engage with together (One of the caveats of working with asynchronous material as a busy professional, is that it is challenging to make the time to engage. This can be mitigated if you work through the asynchronous materials as a collective).
- (vii) Theories and rationale that are being used to determine professional learning models should be informed by systematic research in Māori-medium contexts. In 2012, the MoE was contracting Pauline Waiti to consult with the sector and to develop a model that would be most efficient for Māori-medium contexts (MoE, 2003-2012). The outcome of the Hangarau Beacon Project was not available in the materials that the MoE had available about the Marautanga Hangarau but the author was told confidentially that this research had been cut short due to political reasons.

6. INITIAL CONCLUSIONS AND FURTHER RESEARCH

There was an unexpected gap in the literature, in that a history has not yet been written focusing on the evolution of PLD in Aotearoa-New Zealand. Wylie (2012) and NZCER (2013) were used to read around the edges of the gap, as Wylie speaks of some of the developments in the field, in relation to her focus on the transition to schools as self-managing units. Evaluations of specific initiatives conducted by Māori researchers was helpful in reading around part of the gap (i.e., Marshall & McKenzie, 2011; Matamua, 2012; Murphy et al., 2009) and a series of professional conversations with colleagues filled in the rest of the blanks – but it would be recommended for a complete history of PLD in both the English-medium and Māori-medium educational sectors in New Zealand would benefit the next generation of professional development facilitators. There was a related challenge getting access to MoE documentation that impacted and directed curriculum development and associated implementation support to critique coherence issues.

Effective ongoing PLD is argued as vital to best practice (Lemon et al., in-press; Fowler, 2012; Murphy et al., 2009; Robertson & Murrhiy, 2006; Timperley et al., 2007, 2008). Research must be conducted in a range of Māori-medium contexts to evaluate what is most effective for Māori-medium educational contexts and to evaluate the principles of best practice for the Māori-medium sector. It is expected that the number of experts and schools will grow as Māori-medium education grows and becomes the first choice of education for their children and grandchildren. The sector

needs to grow to reach a critical mass to ameliorate the challenges of designing professional development for teachers in the area (and indeed, the challenges of curriculum implementation).

The PLD documentation also identified a gap in the primary sector. From the early documentation, through to the Hangarau Beacon Project in 2012-2013, it is evident that there is significant diversity in pedagogical approaches to teaching and learning Hangarau, including a range of problem-centred, constructivist and sociocultural pedagogical approaches based on a foundation of mātauranga Māori. Despite this diversity, Māori-medium contexts have a commonality in the use of local knowledge and kōrero tuku iho (history through oral tradition) to provide a context for Hangarau practice. This use of local/place-based knowledge “grounds the teaching and learning programme in the kura’s locality and the associated whakapapa (genealogical connections) and is reflected in the marau-ā-kura (local curriculum) that many of them have developed” (MoE, 2003-2012, p.20).

There is a need to establish coherent systems at various levels that will preserve, update and be responsive to the curriculum support materials and PLD needs for Māori-medium settings. This may be in various forms –blended models for PLD: asynchronous and face-to-face components. Successive governmental administrations have invested in Hangarau – however, this investment needs to be ongoing and available long-term. Ethically and culturally the work of others needs to be valued and retained – not thrown away at a set date. When data is collected and resources made, provisions should also be made for the longevity of the resource – for future generations. We need to look back to move forwards.

The recurring challenges across the domains of curriculum development and implementation indicate a need for increased investment in the need to ensure coherence. Without this increased investment, the cycles of shortages will continue including shortages in the number of experts who are fluent speakers of te reo Māori; shortages of schools that can participate in trialling, development and review of either curriculum documents or curriculum support materials.

Hangarau has consistently been identified as a curriculum area that holds great potential for cross-curriculum teaching and learning yet there have been significant misconceptions about the curriculum since its inception, and it continues to be underrepresented in the taught curriculum. A common misconception is that Hangarau is synonymous with devices or high technology. That is, people commonly say, ‘Hangarau is educational technology, equating with the use of educational technologies’. It is not. Hangarau is strongly connected to the place, providing many opportunities for teachers and schools to research, reclaim and reframe localised indigenous knowledge. As an emerging discipline, Hangarau needs further research, more support materials and PLD opportunities to facilitate an increasing interest in the field and the future growth of the discipline as one that can be studied from early childhood to the tertiary level.

An important question for education policymakers is whether attending to curriculum coherence leads to meeting the needs and fulfilling the aspirations of the Māori-medium education community. The sector argues that more autonomy and self-determination are vital to Māori-medium schooling, where the communities that hold the knowledge should have a say in resource priorities. Likewise, Māori communities need to be the ones who make the decisions about where this information is stored and who gets access to it. He ao te rangi ka uhia, he huruhuru te manu

ka rere. The world is covered by the sky, it is because of feathers that a bird can fly. The Māori-medium sector, with all of its complexities, needs to have autonomy and self-determination to be able to continue the processes of indigenisation. The sector needs investment to grow and to break the cycles of problems and issues that have been ongoing for the last thirty years. This investment will allow the sector to fly.

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