

Maramataka Māori: Embedding Indigenous Knowledge(s) in Education

by

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Abstract

While delving into the literature on the inclusion of Indigenous knowledge(s) within academia and the New Zealand education system a prominent discussion point for many was whether or not Māori knowledge could be considered science. This became even more obvious at the Maramataka Symposium 2022 in Ōtautahi (Christchurch) that I was fortunate enough to attend as Kari Moana Te Rongopatahi's Ngā Pae o te Māramatanga intern. This was a wānanga-focused event spread out over two days that was full of wisdom from many Indigenous scholars of both Māori and kānaka Maoli descent. Discussing all things Maramataka (the Māori lunar calendar), Tātai Arorangi (Māori celestial knowledge), and Kaulana Mahina (the Hawaiian lunar calendar) with the focus of the event being to celebrate Indigenous knowledge and to consider the challenges of embedding the Maramataka in the New Zealand education system. Throughout the workshops and presentations attended, I noticed many of the speakers were bringing to light the concept of pūtaiao (science) and where our traditional knowledge of the Maramataka sits within that realm. Therefore, this report explores the history, or lack of, Indigenous knowledge within the education system and the current discussions on the inclusion of mātauranga Māori alongside western science, heavily focusing on the Maramataka and tātai arorangi. This report further questions whether or not our traditional knowledge, such as our mātauranga maramataka, be embedded in the mainstream school curriculum, and if yes, how?

This report has been supervised by Kari Moana Te Rongopatahi, Jennifer Smith, and Dr Te Hurinui Clarke, and supported by Dr Matiu Ratima, who have each been generous with their guidance and wisdom from their particular areas of expertise. Similar to my supervisors, I share an immense connection and interest in our ancestral mātauranga that surrounds the maramataka. To share these knowledges within colonial institutions and curricula is not only challenging, but a risk for te iwi Māori. Therefore, the focus of this research project is to explore the kōrero from Indigenous scholars and maramataka experts on the challenges and collective concerns, as well as methods and suggestions from both sides of the debate, and to share my own whakaaro and findings.

He Kupu Whakamihi

Tuatahi, he uri tēnei o Ngāi Te Rangi, Ngāti Awa, Ngāti Pūkiao, me Te Arawa Hoki. I grew up in Waikato-Tainui and Tauranga Moana. My mother is from Ōpōtiki, and my father is from Tauranga Moana, Matakana Island, and Rotorua. In 2022, I completed my Master of Arts and Social Sciences Degree at the University of Waikato, where my thesis discussed the implementation of Aotearoa New Zealand histories in the history curriculum refresh. This has led me to gain an interest in the inclusion of mātauranga Māori in the Aotearoa New Zealand education system, with the intention of encouraging and protecting our ancestral knowledges. This journey has been incredibly supported by my whānau and friends back home around the Waikato, Coromandel and Waiariki, Bay of Plenty areas. E rere ana te mihi aroha ki a koutou.

Tuarua, this research project was supported by an internship programme with Ngā Pae o te Māramatanga, the Centre of Research Excellence funded by the Tertiary Education Commission (TEC) and hosted by the University of Canterbury – for a Research Internship during the summer of 2022 - 2023. It was supervised by Kari Moana Te Rongopatahi, Jennifer Smith and Dr Te Hurinui Clarke, and supported by Dr Matiu Ratima. Although throughout the duration of this project we saw a few hardships come our way, I am grateful for all of the mātauranga, guidance and support I was lucky enough to receive. Tēnei te mihi ki a koutou.

Introduction

When the sun touches the horizon in the evening, when the moon peers over the hills and the tide is at its fullest. That is the fullest of the full moons

The elders, quoted by Wiremu Tāwhai¹

The Māori monthly lunar calendar, known as Maramataka, is an integral part of the Māori culture. Pre-European settlement, this body of knowledge would determine when our tīpuna (ancestors) would hunt, gather and plant crops, among many other ways of life.² Without the in-depth understanding of the stars, sun and moon our ancestors would most likely not have been able to navigate Te Moananui a Kiwa (The Pacific Ocean) to Te Wai Pounamu and Aotearoa New Zealand, let alone survive in this foreign and vastly different land.³ The main kaupapa, or focus, of this research project is embedding Indigenous Knowledge(s) in education with a more in-depth look into incorporating the Maramataka in the English medium schooling system. This is not a new idea or thought. This is a discussion that is being had by many leading tohunga of Māori astronomy as a part of the uprising in Indigeneity revolution and in preparation for the emergence of te ao Māori in the education of our rangatahi and tamariki in English medium-schooling.⁴ In the 1970's, a group of students from around the Pacific were taught and guided by Pacific voyaging traditions expert Mau Piailug, joining other aspects of the Pacific culture's in an Indigenous revolution for the revitalisation of our ancestral knowledge(s).⁵ Since then the push for the revitalisation of mātauranga Māori has been at the forefront of many Māori organisations and scholars' works. We are now in a place where the incorporation of mātauranga Māori is taking place within the mainstream education system.⁶ This report hopes to highlight the past and present mahi taking place to guide us into including the traditional wisdom around the maramataka into English medium

¹ Wiremu Tāwhai, *Living by the Moon: Te Maramata A Te Whānau-Ā-Āpanui* (Wellington: Huia Publishers, 2019), p. 17.

² Mere Roberts, Frank Weko & Liliana Clarke, *Maramataka: the Māori Moon Calendar*, research report no. 283 (Christchurch: Lincoln University. Agribusiness and Economics Research Unit., 2006).

³ Pauline Harris, Rangi Matamua, Hoturoa Kerr, Takirirangi Smith & Toa Waaka, 'A Review of Māori Astronomy in Aotearoa-New Zealand', *Journal of Astronomical History and Heritage*, 16.3 (2013) 325-336 (p. 330).

⁴ Harris et al., p. 326.

⁵ Harris et al., p. 326; Smith, Graham Hingangaroa, 'Kaupapa Maori Theory: Theorizing Indigenous Transformation of Education & Schooling' (Hyatt Hotel, Auckland, N.Z.: conference paper, 'Kaupapa Maori Symposium' NZARE / AARE Joint Conference, December 2003), pp. 2.

⁶ Harris, et al., p. 326.

schooling; the discussions being had; the hesitations being shared and the challenges that have arisen.

Most of the work I focus on in this report has been published after the year 1990. This is due to a rise in interest, or urgency for revitalisation for many aspects of the Māori culture, and in result, the scholarship that explores why and how we can include mātauranga Māori in our English medium schooling systems. Pauline Harris, alongside fellow members of SMART (The Society for Māori Astronomy Research and Traditions), describe this as ‘a resurgence of interest in Māori astronomical knowledge, seeded by the reactivation of mass celebrations of the Māori New Year’.⁷ Māori-led initiatives, such as *Nga mahi a Papa Tinaku* and SMART have already been established, which their main focus is to research traditional Māori knowledges, science, and horticultural practices, including the Maramataka.⁸ This not only proves the fast-emerging interest, and need, rising within New Zealand for the incorporation of mātauranga Māori in our everyday lives, but also shows that there is research already being facilitated on how we educate and practise the traditional ways of our ancestors.

This brings me to the research project that is the reason for this report. I was lucky enough to be offered the role of raumati intern for Ngā Pae o Te Māramatanga where I am to submit a report that will contribute to the work of a wider research project facilitated by Kari Moana Te Rongopatahi. The title of the internship is *Embedding Indigenous Knowledge(s) in Education*, and the focus is to research, discuss and highlight key findings from within academia that may contribute to the kaupapa. On December 12th-13th 2022 I was fortunate enough to attend the Maramataka Symposium in Ōtautahi, which was facilitated by Kari Moana Te Rongopatahi and her team at the University of Canterbury. During this two-day event I watched presentations and was involved in wānanga that focused on all things Maramataka, Tātai Arorangi (Māori celestial knowledge), and Kaulana Mahina (the Hawaiian lunar calendar) as the key topic of discussion.⁹ I was introduced to leading scholars from within the field and met many incredible students and teachers who were both intrigued and committed to the embedment of Indigenous knowledge(s) within the education system. This experience brought to the forefront many key questions, challenges, and solutions for the kaupapa, in which I focus on throughout my research and discuss within this report.

⁷ Harris, et al., p. 326.

⁸ Mere, R., et al., p. 3.

⁹ *Maramataka Symposium 2022* (2022) <<https://sites.google.com/view/maramataka-symposium/home>> [accessed 13 December 2022].

This report follows an outline that begins by acknowledging the kaupapa, a brief explanation of language I use, my stance on the topic, the methods I use, and the limitations I experienced throughout the duration of this project. The second section of this report discusses the origins of this kaupapa, by acknowledging the global Indigenous revolution. It is important to me to highlight the influential work done by our people in the fight for keeping our culture alive. This has been discussed in the section titled: *Colonisation, 'Decolonisation' and Revitalisation*. In here I write a brief outline of the history of colonisation, the impacts on mātauranga Māori in the education system, and the Indigenous resurgence. In the second section titled: *Pūtaiao and Western Science*, I highlight a key topic of discussion throughout the Maramataka Symposium and current scholarship that was of pūtaiao and western science. Many of the scholars questioned whether or not our traditional knowledge should be considered as 'science', in a western sense. Since then, I have delved into the literature that discusses incorporating traditional knowledge in the school science curriculum and elaborate on what scholars have previously argued for on this topic. In the third section titled: *Challenges*, I bring to light the challenges that we are facing within the education system, challenges that scholars believe may arise, or what could potentially become a problem when merging with westernised institutions. The issue at hand is navigating incorporating Indigenous knowledge in a system designed to dismantle and harm the knowledge of our ancestors, and so this report hopes to bring awareness to those hesitations. This delves deeper into the debate on pūtaiao vs western science, as well as acknowledging the many other struggles and risks that have been mentioned by both te iwi Māori and Pākehā.

It starts with the schools, where we have the opportunity to teach our tamariki and rangatahi the knowledge of their ancestors, as an act of decolonisation and revitalisation for Māori identity and belonging where our ancestors were stripped of land, reo (language), tikanga (traditions), and mātauranga. Rangimarie Rose Pere (1998) has been widely quoted breaking down the origins of the kupu for children:

Tamariki: Tama is derived from Tama-te-ra the central sun, the divine spark; ariki refers to senior most status, and riki on its own can mean smaller version. Tamariki is the Māori word used for children. Children are the greatest legacy the world community has.¹⁰

¹⁰ Rose Pere, Te Wheke: A Celebration of Infinite Wisdom (Gisborne, New Zealand: Ao Ako Global Learning, 1991), p. 4; Lesley K. Rameka 'Kaupapa Māori Assessment: Reclaiming, Reframing and Realising Māori Ways

It is evident here that tamariki have always been at the centre of te ao Māori, held at the utmost respects. It is in the hands and minds of our tamariki, where the power of decolonisation and revitalisation really sits. And so, this leads me to the global project that is taking place, the Indigenous revolution. However, this does not come without its challenges and risks, which I explore further throughout this report.

Language

During this research project, and as an on-going life project, the use of particular language is constantly changing. As I received feedback from my supervisors and explored the literature, I am continuously enlightened by whakaaro from experts in the field that resonated with my own. Therefore, I will use this section to explain the use of certain kupu throughout this report.

Firstly, it is important to acknowledge early on in this report that I descend from Ngāti Awa, Ngāi Te Rangi, Ngāti Pūkiao, and Te Arawa, and so the dialect and some words used differ from that of my supervisors who reside in Te Wai Pounamu (The South Island). There are kupu throughout this report that will have various meanings and alternative ways of spelling, from iwi to iwi, hapū to hapū, and whānau to whānau.

Secondly, I have previously used the term ‘mainstream’ as a description for English medium schools. However, it has become apparent to me that it would be better fitting that I instead use the terms ‘English medium’, ‘Māori medium’, and ‘Bilingual medium’ for the duration of this report, to differentiate between the various schools depending on if they are kaupapa Māori or Western-based. The whakaaro behind this is that when we title something as ‘mainstream’, it is giving mana to that said thing. In this case, describing English medium schools as ‘mainstream’ means that we give them the power of being the ‘main’, or centre, of schooling. Thus in-turn disregards kaupapa Māori schools, or any kura that deviate from the more common eurocentric schools.

of Knowing and Being Within Early Childhood Education Assessment Theory and Practice’, *Frontiers in Education* (2021), p. 4.

Likewise, I have used the term ‘decolonisation’ to describe the process of dismantling the colonial impacts inflicted on our culture, land and people. However, it has been said by some academics that the term ‘decolonisation’, much like ‘mainstream’, again hands over the mana from the colonised to the coloniser by referring to ‘colonisation’ within the term.¹¹ Instead, it is suggested to use the words ‘conscientization’ or ‘consciousness-raising’, as it then puts Māori at the centre of the kaupapa, which I also do throughout this report.¹²

Methodology

The process of this project originally began in 2020 when I started my own maramataka journey. I have been following many different maramataka, while slowly learning to connect to my own, on the northeast coast of Aotearoa (the North Island of New Zealand). I was not brought up with teachings of the Māori lunar phases and so it has taken a few years to understand which has best resonated with me. Growing up in both Kirikiriroa (Hamilton) the Bay of Plenty region, to now living in the Coromandel just up the road from my whānau in Tauranga, my sense of tūrangawaewae is both inland and on the north-east coast. It has taken me a while to navigate the marama and the stars, in figuring out how they are influencing me and my surroundings, depending on where I am. Therefore, this journey/research project, began for me a few years ago when I began reading, listening, and observing the maramataka. I have then applied my own observations, as well as the various mātauranga maramataka that I have learnt along the way, to this project.

I originally planned to present this report in the form of a literature review where I highlighted what is currently being discussed throughout scholarship on this kaupapa. Although this has remained the core of this project, I also felt it was important to include my own reflections, thoughts, and ideas. Since I am personally connected to the maramataka and feel passionately about our traditional knowledge within mainstream systems, I felt it was important to incorporate my own whakaaro within the final research project. And so, after discussing this with my supportive supervisors, this project has become a report that focusses on the literature of this kaupapa, with the inclusion of my own reflections.

¹¹ Smith, 2003, p. 2.

¹² Smith, 2003, pp. 2-3.

The outline of this report is in sections which I have grouped into phases of the lunar cycle, based off-of the knowledge of experts from within the field such as Wiremu Tāwhai, Hinemoa Elder, and others. It is important to note that there are hundreds of variations of the maramataka across Aotearoa, and even more throughout Te Moana-nui-a-Kiwa (The Pacific Ocean).¹³ As I currently reside on the Northeast coast, I have pulled heavily from Te Maramataka a Te Whānau-ā-Apanui. This is the maramataka I am closely connected to and personally follow. Each section of this report has interwoven the phases of the maramataka, based off-of my own ideologies, the knowledge from within the literature and the common themes that have been most prominent throughout the scholarship. I then conclude each section with my own personal reflections and observations.

Limitations

This research project aims to highlight some of the key experts, scholarship and Māori-led groups, such as SMART, that have been working towards this kaupapa for some time. However, this report is limited and does not claim to mention every piece of literature that has contributed to this topic. This project is only a small contribution to the important work of my supervisors, Kari Moana Te Rongopatahi, Jennifer Smith and Dr Te Hurinui Clarke. I hope to present research and somewhat of a literature library that will aid them and their amazing work, in any way that I can.

This report does not have the space, the time, nor do I have the expertise to be able to acknowledge all of the different maramataka. The reflections and observations included are of my own, and the maramataka I follow, which I will elaborate on further throughout the report.

Rākaunui and Rākaumatohi...

And so, beginning with this introduction, I would like to start by discussing Rākaunui and Rākaumatohi, the full moons. In Te Whānau-ā-Apanui, Rākaunui is the beginning of the marama, or lunar cycle and this is where I also begin my own the marama lunar cycle. Therefore, it seems fitting to begin this report alongside Rākaunui. Rākaunui and Rākaumatohi both bring high energy and productivity. As discussed by Wiremu Tāwhai in *Living by the Moon: Te Maramataka a te Whānau-ā-Apanui* (2013), he writes that our ancestors would begin the next maramataka cycle by identifying the full moon, te Rākaunui,

¹³ Roberts et al., *Maramataka: The Māori Moon Calendar* (2006).

from there, they were able to plan the rest of the month¹⁴. The introduction is the beginning of a discussion, and so, I hope that this report helps to spark or bring to light a discussion which focuses on the wider kaupapa at hand, decolonising the current westernised education system in Aotearoa New Zealand.

Colonisation, 'Decolonisation' and Revitalisation

The Colonisation of Mātauranga Māori in Education

Pre-colonisation, Māori and iwi peoples had our own education system, or wānanga, which focused on Rongoā (medicine), history, agriculture, and many other aspects of te ao Māori.¹⁵ Not long after European invasion, missionaries and the crown established their own traditional European educational institutions as a colonial tool to culturally assimilate the Māori people and dismantle our culture.¹⁶ Ranginui Walker (2016) details the underlying intentions of the crown and church, in establishing their schooling system in New Zealand.¹⁷ He explains how Governor Grey's Education Ordinance of 1847 aimed to remove and isolate tamariki Māori from their whānau, hapū and iwi as a tool of cultural assimilation, to quickly convert Māori to "European ways".¹⁸ This further led to the establishment of the Native Schools Act 1867 and Native Schooling system which continued into the 1960s.¹⁹ Like prominent Māori academic and leader Ranginui Walker, many scholars have discussed the influence of colonisation on our mātauranga Māori and since the movement to revitalise traditional knowledge, are currently considering decolonising the education system through its inclusion in the English medium schooling system.

It is evident throughout the work of Māori scholars such as historian Nēpia Mahuika just how impactful that Māori and iwi histories being taught by tauīwi (non-Māori) is on the inaccurate narratives of our pre-colonial history.²⁰ As Mahuika has highlighted, the teachings of our

¹⁴ Tāwhai, p. 17.

¹⁵ Ranginui Walker, 'Reclaiming Māori Education', *Decolonisation in Aotearoa: Education, research and practice*, ed. By Jessica Hutchings and J Lee-Morgan (Wellington: NZCER Press, 2016), p. 21; Georgia Palmer, 'A Review of Māori History in Schooling and Curricula in Aotearoa New Zealand', (dissertation, University of Waikato, 2021) pp. 3-4.

¹⁶ Walker, p. 20; Palmer, pp. 6-10.

¹⁷ Walker, pp. 20-23.

¹⁸ Walker, p. 23.

¹⁹ Palmer, pp. 9-11.

²⁰ Mahuika, Nēpia, 'Revitalizing Te Ika-a-Maui: Māori Migration and the Nation', *New Zealand Journal of History*, 43.2 (2009), 133-149 (p. 133).

history, as ‘myths and legends’ was the beginning of a lengthy history of ‘neglect’, oppression and disregarding the origins, traditions, and wisdoms of our ancestors.²¹ In result, through the eyes of the colonisers Māori peoples were seen as the inferior race who needed to be essentially enlightened by pākehā. To not just simply teach our histories but to tell the stories of our ancestors, would be a method of decolonisation and revitalisation and in return, healing for some of the injustices that have been forced upon our culture and our identity. I refer to Māori and iwi histories as a case for including mātauranga Māori in English medium schooling, as similar challenges and methods apply to other aspects of Indigenous knowledge, such as the Maramataka. It is the same fight.

Since colonisation, the New Zealand education system has enforced oppression and cultural assimilation against Māori peoples and culture.²² This has unfortunately created the inaccurate narratives around mātauranga Māori being excluded and regarded as inadequate body of information for the education curricula, besides being the traditional knowledge of this land. Mahuika highlights the injustices of Indigenous histories in Western Academia, and further discusses the more common, and some would argue more palatable, version of ‘Māori history’ often written by non-Māori. These narratives label Māori history as myths, fairy tales, and fables.²³ Mahuika discusses the whakapapa of Maui-Tikitiki-a-Taranga, who to most is known as the demi-god or ‘mythic hero’. However, for te uri o Ngāti Porou, he is their direct tipuna.²⁴ This article addresses the influence that the European narrative has had on our histories and how our kōrero tuku iho, our knowledges and wisdoms that have been passed down for centuries, are now commonly deemed as ‘myths’.²⁵

Colonisation has hugely impacted the teaching of mātauranga Māori in many aspects. Since early European settlement, the Maramataka and Māori ecological knowledge have been directly affected by assimilation methods of missionaries.²⁶ And since the establishment of Native schools and public schooling, the New Zealand Education system has been designed around the Western world flourishing, and the Māori culture diminishing, or so the colonisers

²¹ Kēpa Morgan & Robyn Manuel, ‘Western Science and Indigenous Wisdom: Is integration possible, practical, plausible?’, *New Zealand Science Review*, 76.1-2 (2020) 6-12 (p. 11).

²² Durie, Arohia, ‘Emancipatory Maori Education: Speaking from the Heart’, *Language Culture and Curriculum*, 11.3 (1998) DOI: 10.1080/07908319808666558, 297-308 (p. 300).

²³ Mahuika, 2009, p. 133.

²⁴ Mahuika, 2009, p. 133.

²⁵ Mahuika, 2009, p. 133.

²⁶ Harris, et al. 2013, p. 333.

hoped.²⁷ However, in the 1980's there was the emergence of an 'educational and schooling revolution', well-described by Graham Hingangaroa Smith (2003):

...developed out of Māori communities who were so concerned with the loss of Māori language, knowledge, and culture that they took matters into their own hands and set up their own learning institutions at pre-school, elementary school, secondary school and tertiary levels²⁸

From this revolution sparked an on-going fight for the 'conscious-raising' and revitalisation of mātauranga Māori, Te Reo Māori, toi Māori, and many other aspects of the Māori culture.²⁹ In a 2013 article, Māori astronomy experts, Pauline Harris, Rangī Matamua, Takirirangi Smith, Hoturoa Kerr and Toa Waaka discuss the impact of colonisation on traditional Māori astronomy knowledge, claiming that 'by the 1850's in many tribal districts the pre-colonial systems of growing and harvesting had already been abandoned'.³⁰ However, the Indigenous resurgence has forced the oppressors to have a hard look at what is being taught about the Māori culture, if any, in English medium schooling.

In 2019 the Labour Government announced the inclusion of Māori history as a compulsory subject within English medium schooling. Although this is a huge step in the right direction, concerns have been raised.³¹ The incorporation of Indigenous knowledge(s) within non-Indigenous systems is not only a challenging task but it is also a risk, that brings up trauma and difficult histories, for both the colonisers and the colonised. However in 2021, after fighting for 18 months Te Wharekura o Ngāti Rongomai were finally signed off by Education minister Chris Hipkins and the Ministry of Education to rearrange the schooling year in accordance to the Maramataka, rather than following the Gregorian calendar and solar dating system.³² Co-principals Tūkiterangi and Rēnata Curtis were asked why they wanted to follow the Maramataka, Tūkiterangi responded, 'It's a Māori pathway, it's Māori teaching, it's Māori developing Māori. We wanted to find out how we could implement this into today's

²⁷ Palmer, pp. 6-15.

²⁸ Smith, 2003, p. 6.

²⁹ Smith, 2003, p. 6; Harris et al., p. 334.

³⁰ Harris, et al., 2013, p. 333.

³¹ Jacinda Ardern & Chris Hipkins, 'NZ History to be taught in all Schools', *Ministry of Education* (Wellington, 12th September 2019) <<https://www.beehive.govt.nz/release/nz-history-be-taught-all-schools>> [accessed 6th August 2021].

³² Herewini Waikato, 'First school in New Zealand to follow Māori calendar', *Stuff* (2021) <<https://www.stuff.co.nz/pou-tiaki/300322115/first-school-in-new-zealand-to-follow-mori-calendar>> [accessed 20th January 2023].

teaching curriculum.³³ With the help of Maramataka expert Rangi Matamua, New Zealand has our first kura paving the way. Now, in 2023, Te Wharekura o Mauao will also be trialling a Maramataka Māori-based calendar for their school year.³⁴

The Indigenous Resurgence

The uprise in teaching of Māori astronomy emerged in the 1970's when master navigator Mau Pialug began teaching traditional navigation techniques which included traditional celestial mātauranga.³⁵ Tohunga in the field such as Hector Busby were taught in hopes to revitalise this body of knowledge, which has been achieved with the knowledge being passed down for generations since.³⁶ With the revitalisation movements came the establishment of kohanga reo and kura kaupapa Māori.³⁷

Today, we have Māori-focused initiatives focused on revitalising the teaching of Indigenous knowledge. A leading group for this is *The Society for Māori Astronomy Research and Traditions* (2017), or SMART trust, led by tohunga of mātauranga Māori, science, education and Māori astronomy.³⁸ In a 2018 article Pauline Harris discusses the groups research programmes, including the development of portable planetariums which merge western science and digital technologies with traditional ecological knowledge to create an educational and interactive experience for rangatahi.³⁹ SMART and other Māori-led groups have dedicated themselves to the preservation and revitalisation of mātauranga Māori, with the key focus to develop traditional knowledge within our communities in Māori astronomy.⁴⁰ Harris, Matamua, Smith, Kerr and Waaka explain that SMART and other Māori initiatives 'follow in the footsteps of earlier revitalizers, such as the Oceanic navigators, Māori medicine (Rongoa Māori) groups and canoe-builders, by revitalizing yet another part of Māori knowledge, namely, that pertaining to the heavens.'⁴¹

³³ Waikato.

³⁴ Was advised of this by Ms Tara Kanji (principle of Tauranga Girls' College, Tauranga New Zealand) in the final days of this project. Confirmed with the kamiahi in office administration at Te Wharekura o Mauao (27th February 2023), however, I was limited with time to discuss further.

³⁵ Harris et al., p. 326.

³⁶ Harris et al., p. 326.

³⁷ Smith, p. 7.

³⁸ Harris, p. 136.

³⁹ Harris, p. 137.

⁴⁰ Harris, p. 136; Harris., et al., pp. 326-327.

⁴¹ Harris, et al., p. 326.

Ōku whakaaro... Takirau, Oike, Korekore Tuatahi, Korekore Rawea, Korekore Whakapiri

It is ngā marama o Takirau, Oike, Korekore Tuatahi, Korekore Rawea, and Korekore Whakapiri I reflect on when thinking of colonisation, ‘conscientisation’, and the revitalisation of our mātauranga. To me, this is a time to reflect on the injustices on our people since European settlement in Te Wai Pounamu and Aotearoa. I mourn the losses of my tīpuna, I think of the pain experienced as they were discriminated against and challenged. I often go internal during this time and struggle with anger and frustrations that arise when thinking of the generational trauma endured by te iwi Māori, since colonial-contact. Beginning with Takirau and Oike, the energy I have gained from the fuller moons is quickly transitioned into anger. During the korekore tuatahi and korekore rawea, I am more internal, reflective, mournful. Expressed by Dr Hinemoa Elder in *Wawata*, this is ‘a time of honouring our losses’.⁴² By korekore whakapiri and the emergence of the Tangaroa phases, I am re-energised and ready to re-direct my energy towards the fight and revolution of Indigeneity.

Pūtaiao and Western Science

*[f]rom the Universe, to the tracking of time, to the planting and harvesting of food, the Sun, Moon and stars were no doubt an important and substantial part of Māori knowledge*⁴³

The board members of SMART (2013)

At the 2022 Maramataka Symposium, a prominent question that was debated, was whether or not mātauranga Māori, or more specifically the Maramataka could be considered science, and if we as Indigenous peoples would want our knowledge to be categorised as such when considering the origins of western science vs the sacredness of our ancestors wisdom.⁴⁴ The main focus of this research project is to evaluate how we embed the Maramataka in the current education system, and so, this report highlights some recent scholarship that shares opinions, suggestions, and pedagogical methods that should be considered. Māori have looked at Māori astronomy as traditional ecological knowledge and science.⁴⁵ This section explores what Māori scholars are saying in regard to the question: Can the Maramataka and Māori celestial knowledge be considered science?

⁴² Hinemoa Elder, *Wawata: Moon Dreaming* (Auckland: Penguin Random House New Zealand, 2022), p. 162.

⁴³ Harris et al., p. 334.

⁴⁴ Morgan and Manuel, pp. 6-7.

⁴⁵ Roberts et al., p. 1.

The kupu for ‘science’ in Te Reo Māori is pūtaiao.⁴⁶ Teacher of Māori science, Georgina Tuari Stewart (2019) elaborates on the pūtaiao vs western science debate, whilst exploring whether or not there is a place for mātauranga Māori in the science curriculum. Stewart discusses the debate on whether or not Māori knowledge could be labelled as ‘science’ by western standards and further explains that due to there being no right or wrong answer, the question can never ‘be considered finally settled.’⁴⁷ Stewart highlights how this is not only an issue within academia, but this debate also concerns teachers, who are having to consider the tamariki Māori and rangatahi Māori tauira (student) whom they teach.⁴⁸ She writes:

One answer to the question of ‘Māori science’ is that yes, mātauranga Māori is a traditional indigenous form of science from Aotearoa (Peters 1993); the other answer is a firm no (Nola & Irzik 2005). Many who deny the concept of ‘Māori science’ regard it as nonsense, and part of the growth to dangerous levels of ‘anti-science’ attitudes in society (a clear statement of this position was made in Matthews 1995)⁴⁹

Using Māori science as our case study, we are shown the resistance that we face from non-Māori who are unwilling to accept our traditional knowledge as adequate bodies of knowledge for the New Zealand curriculum. However, these are also concerns voiced by Māori that if we are to include mātauranga Māori in a westernised education system, we may have the issue of having our knowledge misunderstood and mistaught.

Māori scholars have discussed the ‘lost in translation’ theory and implications of translating from Māori metaphors or kupu (*words*) to western methodology.⁵⁰ The differences between te ao pākehā (the European worldview) and te ao Māori (the Māori worldview) means that we often struggle to find direct translations or European concepts that mean the same thing.⁵¹ Alongside Stewart, Māori philosopher Carl Mika have explained that ‘[c]are must be taken when one set of indigenous concepts (and indigenous terms for those concepts) is about to be somehow equated with another set of concepts, derived from Western knowledges and languages’.⁵² When discussing the importance of this, Mika and Stewart explain that

⁴⁶ Georgina Tuari Stewart, Georgina Tuari, ‘Mātauranga and Pūtaiao: the question of ‘Māori science’’, *New Zealand Science Review: Special issue – Mātauranga and Science*, 75.4 (2019) 65-68 (p. 65).

⁴⁷ Stewart, p. 65.

⁴⁸ Stewart, p. 65.

⁴⁹ Stewart, p. 65.

⁵⁰ Carl Mika & Georgina Tuari Stewart, ‘Lost in Translation: western representations of Māori knowledge’, *Open Review of Educational Research*, 4.1 (2017) 134-146, DOI: [10.1080/23265507.2017.1364143](https://doi.org/10.1080/23265507.2017.1364143), pp. 134-146.

⁵¹ Mika and Stewart, pp. 134-146.

⁵² Mika and Stewart, p. 142.

incorrect translations or definitions of a Māori kupu or concept, especially in regards to te taiao (the natural world) can lead to ‘profound consequences’, and one must be aware of not ‘colonising’ another aspect of the Māori culture.⁵³ This is important to keep in mind when considering Māori science as something to be taught in the science, or general curriculum. In this case, as traditional ecological knowledge, this may concern the Maramataka. However, traditional knowledge and Māori concepts present a completely separate worldview and different way of understanding the world, as the current Eurocentric science curriculum.

Despite years of evidence and proof that Māori ancestral wisdom is more than adequate knowledge that our tamariki and rangatahi should be being taught in English medium schools, it is the colonisers view and ambitions that led to mātauranga Māori being thought of as unimportant, inaccurate, or unworthy of being considered an essential body of knowledge, to be taught in the New Zealand curricula. Traditional Māori knowledge around science and astronomy has proven itself to be ‘worthy’ of the New Zealand school curriculum, and it is evident that the reason for its exclusion was because of colonial ambitions. Whether or not Māori want to consider mātauranga maramataka as ‘science’, one thing that is clear is the discussion on how accurate and knowledgeable our tīpuna were, and that there is a need for it to be taught to our tamariki.

Ōku whakaaro... Tangaroa ā-mua, Tangaroa ā-roto, Tangaroa Whakapau, Tangaroa Whāriki Kiokio, Ōtane, Ōrongonui, and Ōmutu

This section of the report draws me to Tangaroa ā-mua, Tangaroa ā-roto, Tangaroa Whakapau, Tangaroa Whāriki Kiokio, Ōtane, Ōrongonui, and Ōmutu. This phase is a personal favourite, where I am most focused, motivated, clear, and energised to mahia te mahi! It is also a time where I feel mostly connected to te taiao, a time where communication from the natural world is extremely vocal. I spend majority of my time outdoors immersing myself in nature, whether it be working outside, wondering around the ngahere, floating down the awa or surfing and floating in the moana. And so, it feels natural to pair these particular marama with the part of the project that is concerned mostly with pūtaiao and western science. During these phases, it is important to listen to what the Maramataka is telling us about our environment, and what we can learn about ecology. At the Maramataka Symposium, many speakers highlighted observation as a key teaching and learning method

⁵³ Mika and Stewart, pp. 141-143.

for understanding the different moons and the effects on the environment. Whether or not one considers mātauranga Māori a form of science, it is quite prominent during these moons that we are able to gain a pretty clear understanding of our natural world, just by listening, watching, and observing te taiao, just as our ancestors did.

Challenges

If we embed our ancestral wisdom within a westernised schooling system, what are the risks for our people and our culture? What challenges will our people experience? Is it worth bringing up the trauma and potential harm experienced by our people, culture, and traditions? While delving into all things Maramataka and the current New Zealand education system, I am fuelled with hope that the rest of the country will be able to follow in the footsteps of Kura Kaupapa Māori. Yet, there are still disarming thoughts and emotions on placing our knowledge in the hands of the crown, as there have been with the inclusion of Māori history and Te Reo Māori in the English medium curricula.⁵⁴ This has been a worry for many Māori scholars who have spoken on the kaupapa. In 1998, Māori educationalist Professor Lady Arohia Durie wrote that, “[a] major educational challenge before Māori, iwi Māori and the state, has been the need to work together to shape an education system which will better meet Māori aspirations in education through appropriate provision”, highlighting the first challenge Māori face in embedding our mātauranga in the curriculum, working with the system that was designed to extinguish our culture and knowledge.⁵⁵ In quoting Ranginui Walker (1990), Durie and Walker describe the New Zealand schooling curriculum as “demanding cultural surrender, or at the very least suppression of one’s language and identity. Instead of education being embraced as a process of growth and development, it became an arena of cultural conflict’.”⁵⁶ However, Durie continues on to discuss that overtime research and findings have brought to light the discrepancies within the education system that have caused Māori to struggle, and in the case of Te Reo Māori revitalisation, this has led government departments to reassess and reshape current policies, such as the 1987 Māori Language Act.⁵⁷

⁵⁴ Smith, p. 3.

⁵⁵ Durie, p. 297.

⁵⁶ Durie, p. 301. Quoting Ranginui Walker, *Ka Whawhai Tonu Matou* (Auckland: Penguin, 1998).

⁵⁷ Durie, p. 303.

More specifically to the Maramataka, Harris explains the importance of research Māori-focused programmes that aim to ‘close the widening gap between Māori/Pasifika knowledge and ‘western science’, such as SMART.⁵⁸ Harris highlights that the previous, and current, approach to mātauranga Māori in the English medium education system have been not been appropriate, and therefore, adding to the harm of our culture and our people.⁵⁹ Board members of SMART have highlighted the disheartening lack of Māori astronomy experts, due to colonial impacts, hence the urgency for revitalisation of this body of knowledge.⁶⁰ However, due to the small numbers in experts, another challenge arises in having the capacity and resources to be able to teach the Maramataka to all kura across the country.

Within Māori communities, there are whānau, hapū, and iwi, who each have their own individual beliefs and traditions, and for the maramataka this is no different.⁶¹ Therefore, another challenge we face is the transformation English medium schooling would have to take from the single-curriculum approach, to enforcing a system that is whānau, hapū, and iwi-focused. Each kura curriculum will have to be not only local, but also whānau-led. And even this would not necessarily be an adequate method, due to the movement and separation of Māori from their tūrangawaewae or ūkaipo. This leads to the question, what would be the best solution to navigating having our rangatahi and tamariki learning about their local knowledges and traditions, in which may be separate to their own? For example, depending on the area some Māori communities traditionally celebrated the marking of a new year with the rising of Matariki (Pleiades), such as Te Tai Rāwhiti, and others celebrated with the rising of Puanga/Puaka (Rigel), such as in Te Wai Pounamu, te uri o Taranaki in the west, iwi from around the Ruapehu area, and the Ngā Puhī people of the far north.⁶²

I believe a solution to having only few individuals who can say they are an expert in Māori astronomy and having to transition from Māori to iwi-focused curriculums, is already taking place. Again, te iwi Māori are paving the way and have already established iwi-focused education plans, such as Te Rūnanga o Turanganui a Kiwa that has done so for Te Atianga a Māhaki, Rongowhakaata, and Ngai Tāmanuhiri. Durie details their education plan:

⁵⁸ Pauline Harris, ‘Portable planetariums in the teaching of Māori astronomy’, *Iwi, institutes, societies & community led initiatives* (2018) 136-148 (p. 137).

⁵⁹ Harris, p. 137.

⁶⁰ Harris, Matamua et al., p. 325.

⁶¹ Durie, p. 305.

⁶² Harris, et al., 2013, p. 230; Roberts et al., p. 15.

The plan would take into account Runanga (council) resources, obligations, and iwi needs and aspirations regarding education. The terms of reference included the following key objectives:

- *to ascertain the educational needs of the descendants of Ngai Tamanuhiri, Rongowhakaata and Te Aitanga a Mahaki;*
- *to recommend the strategic direction that the Runanga should take with respect to meeting the educational needs of its constituent members;*
- *to include consideration of the educational resources and opportunities within the Turanganui a Kiwa Boundaries.*⁶³

This iwi-based education plan is a “broad approach” that understands the importance of “vitality of Te Reo me ona Tikanga (Māori language and culture) within whānau (family), hapū (sub tribe) and iwi (tribe).”⁶⁴ In a chapter in *He Whare Hangarau Māori: Language, culture & technology*, a resource book that focuses on information communication technology (ICT) and mātauranga Māori, Harris discusses effective pedagogical methods to teaching ancient celestial knowledge by looking at kura kaupapa Māori.⁶⁵ If we are to transition to an intertribal-focused approach, each iwi, hapū, and whānau are able to make decisions on who and which Maramataka is to be taught within their kura. In order to successfully transform the current education system to one that includes mātauranga Māori, by Māori and for Māori, it is essential to acknowledge not only Māori as a collective, but more importantly as an inter-tribal peoples.

Harris mentions kaupapa Māori methodology from Professor Graham Hingangaroa Smith’s (2003) ‘Kaupapa Māori Theory: Theorizing Indigenous Transformation of Education & Schooling’ and Professor Lady Arohia Durie’s (2018) ‘for Māori, by Māori’ approach.⁶⁶ On this, Smith explains:

... the lesson of the Kaupapa Māori approach from New Zealand is that transformation has to be won on at least two broad fronts; a confrontation with the colonizer and a confrontation with `ourselves`. This is what I have labelled as the `inside - out` model of

⁶³ Durie, p. 305.

⁶⁴ Durie, p. 305.

⁶⁵ Harris, 2017, p. 137.

⁶⁶ Harris, pp. 137-138.

transformation – in this sense, as Paulo Freire (1971) has reminded us, ‘first free ourselves before we can free others’⁶⁷

To add to these concerns, is not only tangata whenua who have expressed their hesitations on the inclusion of mātauranga Māori in English medium schooling.⁶⁸ There have been other aspects of the Māori culture, such as Māori history and Te Reo Māori, that have been resisted by ‘mainstream’.⁶⁹ However, this specific discrimination has been a challenge that Māori have faced since European settlement, and it is a challenge that Māori have fought, and won against numerous times. So I believe this is not so much a challenge, but instead a mere hurdle that can be overcome.

It is obvious that there is still a fight to be had, and to continue being had, by Māori, for Māori. But as Durie, Harris, and other leading experts from within the Māori education realm have highlighted, we are making progress. The challenges and risks we are being faced with are being overcome, and Māori are paving the way for Indigenous communities all over the world. Whether our mātauranga is included in western curriculums such as history or science, it means our knowledge is more likely to be reaching tamariki and rangatahi Māori who attend English medium kura, and this is the collective hope.

Conclusion

Māori research groups are paving the way to retaining the knowledge of our ancestors through English medium avenues. Thanks to the work being pushed by these Māori leaders, it is not so a question of how we can embed the maramataka in our education system, but more so, why it is important, and who is best to learn and teach our sacred knowledges. As highlighted in most of the literature presented in this essay, since European invasion, scarcely were Indigenous communities handed down the knowledge of the Maramataka and tātai arorangi (Māori astrological knowledge). Within the whānau, hapū and iwi, certain individuals were chosen, and taught from a young age to become tohunga of the field. These experts would be the ones who retained this knowledge within their community and helped to apply the teachings throughout their community. Most commonly discussed throughout the literature on maramataka is Māori horticulture, or mahinga kai, that heavily applied the traditional knowledge of the maramataka throughout their work. However, it was the aim of

⁶⁷ Smith, p. 3.

⁶⁸ Harris, p. 137.

⁶⁹ Harris, p. 137.

the colonisers to put an end to this, in which they nearly did. But since the emergence of the Indigenous revolution here in Aotearoa and Te Wai Pounamu, Māori leaders and tohunga have managed to revitalise and save our mātauranga. Therefore, the next obvious step would be to have our indigenous knowledge reaching all tamariki and rangatahi, through all schooling mediums throughout the motu.

Throughout this report I have discussed key scholars and the work already taking place that aim to revitalise and protect mātauranga Māori, and it is these groups and kura kaupapa Māori that are paving the way and proving that it can be done. It is Māori focused rōpū that have fought for revitalisation of our knowledge and the decolonisation or conscientisation of the colonial impact on our culture and peoples. And now, we are seeing kaupapa Māori kura transform their entire school calendars to following the Maramataka. It is simply a matter of whether or not the rest of Aotearoa and Te Wai Pounamu are going to follow suit.

Ōku whakaaro... Tamatea Āio, Tamatea a Ngana, Tamatea Kai Ariki, Tamatea Tuhāhā

During these moons, I am extra cautious. It is a time where my energy is often low, and I know if I let it, my internal dialogue can aggressively become negative. However, since embarking on my personal Maramataka journey, I have observed this from within and am since learning to redirect that energy to the haerenga I am on. I can feel agitated and stagnant, but I am now aware that these are feelings I do not actually feel towards myself, but the injustices and mamae caused upon my people. And so, this is a time to fuel the fire, ahikaroa, keep the fires burning... to understand that the frustrations and anger I feel can actually be turned into motivation and determination. Described by Tāwhai as: '[o]ne of the most hazardous periods of the lunar month, where local knowledge is imperative', this is a time where we are reminded of the wisdom of our elders, and how we must fight to keep it alive.⁷⁰ Therefore, it seems fitting, that although these moons are known to be tedious and hazardous, if we are smart, we can use this time that brings up anger and frustrations as motivation to fight for our people, our culture, and the knowledge of our tīpuna. Ka whawhai tonu tatou!

To conclude this project, I was grateful to realise that my final week began with the Tangaroa moons, from Tangaroa-ā-Mua to Tangaroa-ā-Roto... and so on, through to Rātapu (Sunday)

⁷⁰ Tāwhai, p. 52.

and the rise of Ōmutu, which is described by Wiremu Tāwahi as, ‘closure approaching’.⁷¹ Tāwhai writes, ‘However, the good lunar signs of the immediate past six days still persist strongly within this Ōmutu day. It still chronicles the same signals of productiveness, lushness and exuberance.’⁷² I do not believe in coincidences, I believe in my ancestors and their traditional wisdom of Hina Marama me ngā Atua Māori. Therefore, to be gifted with this tohu at the end of the internship, I feel blessed and reassured that this work is on the right path. Finally, the submission date for this project falls of Mutuwhenua, described by Tāwahi (2013) as: *The lunar month is in a state of suspension. The moon has gone into recess, and its work at this time has finished*⁷³, which seems fitting.

⁷¹ Tāwahi, 2013, p. 38.

⁷² Tāwhai, 2013, p. 38.

⁷³ Tāwhai, 2013, p. 39.

Key Findings

What has been the most instrumental finding for me during the research of this project, but perhaps the least surprising, is that kaupapa Māori kura have been paving the way since their establishment. English medium schools can learn from the methodologies and pedagogies used in Māori medium kura today. This comes from the prominently shared whakaaro that mātauranga Māori needs to be taught by Māori, for Māori, in order to keep our knowledge, culture, and people safe. Therefore, the answer to the key question of this project leads me to a challenging, but not impossible task. If we were to take the suggestions of my findings, then it would mean for our knowledge to be taught in all kura across Aotearoa and Te Wai Pounamu, then we would need it to be only Māori teaching it. Which is not a bad thought. Furthermore, these will need to be iwi, hapū, and whānau-led.

However, to get to that point, I would suggest more funding and prioritising of Māori-based education groups such as SMART, who have the minds and the passion for figuring out how, what and who teach mātauranga Māori to our tamariki and rangatahi. The programmes and educational tools created and utilised by rōpū such as SMART have proven to reach and actually speak to tauira Māori, which is the collective goal. If the government and Ministry of Education wish to embed Indigenous knowledge in the education system but transforming the entire curriculum and school calendar to follow the maramataka, like Te Wharekura o Ngāti Rongomai and Te Wharekura o Mauao, is too-far forward for English medium kura, then SMART and other Māori-led educational programmes need more support.

I have enjoyed the journey exploring Indigenous knowledge that is currently within the academia on the Maramataka and tātai arorangi, and only hope to contribute to this kaupapa for our people. However, this report has been written for a 10-week internship and therefore the findings are limited. It is essential to acknowledge that there are many influential Indigenous academics and important pieces of literature that I have unfortunately not been able to include in this report, and this I only hope to explore further.

The final finding of this project is that it can be done. Conscientize, decolonise, re-Indigenise, and revitalise.

Ōku whakaaro whakamutunga... Ariroa, Huna, Māwharu, Ōhua, Atua Whakahaehae, Turu

Time to rest, reflect, and relax after a productive couple of months on this waka, navigating the motions, challenges hard-work, and hoping to contribute to the wider kaupapa. It has been an emotional journey, one that I will always be grateful for, as I delve into the research world. These final moons of the Maramataka a Te Whānau-Ā-Apanui are remembered by the elders as a time of rest and play. The hard work for this month has been done, now it is time to enjoy the small fruits of our labour. I feel this as I finish this research project and it comes to end, however, I am feeling the fire in my belly more than ever and know this haerenga is only just beginning.

Kimihia katoa ngā uptake o te kaupapa, ina I kitea, kimihia te rongoā!

Seek out origins and there-in lie solutions

Karawhuia!

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