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People, Partnerships and Pedagogies

A proposal to include Māori perspectives in Aled

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This paper aims to explore the importance of Māori perspectives in AI in education (Aled) development, emphasizing the need for inclusivity and cultural responsiveness. It highlights the underrepresentation of indigenous voices in shaping emerging technologies and proposes a framework for incorporating Māori knowledge and perspectives in AI systems. By recognizing and valuing cultural diversity, we can work towards a more equitable and inclusive future in AI education, minimizing biases and inequities. The framework can then be translated into actionable steps to ensure indigenous voices are heard and incorporated in the design and implementation of AI technologies.

Keywords: Indigenous AI, Artificial Intelligence in Education, Māori-AI

Introduction

Recent advancements in Artificial Intelligence (AI) is transforming the education landscape, especially in online higher education (Chaudhry & Kazim, 2022). The release of ChatGPT-3 (an AI powered chatbot) in November 2022, and ChatGPT-4 in March 2023, have resulted in strong public interest from academia and the public. Some have viewed this development as ‘the end of high-school English’ (Herman, 2022), whilst others have viewed AI as a helpful tool for teachers in the classroom (Hiller et al., 2022). These new AI tools bring a lot of promise into the classroom but also carries huge risk, as such the possibility of scaling risks and bias (Hillier et al., 2022). For instance, Thomson and Thomas (Thomson & Thomas, 2023) demonstrated in their piece on The Conversation how generative AI could perpetuate harmful stereotypes (based on race, ethnicity etc) at scale if implemented without a critical screening process. One reason for the potential of bias is the lack of an indigenous voice during the development of an AI. Indigenous voices (such as Māori) have historically been under-represented in the shaping of the trajectory of emerging technologies (such as AI) (Cibangu, 2020). As AI has yet to be fully implemented in NZ’s education landscape, there is a unique opportunity to recognise and address this problem by proposing a way that AI can be developed and implemented with mātauranga Māori (Māori Knowledge). This helps to enhance the cultural responsiveness and inclusivity of AI systems, minimising the bias, inequities, and marginalization. Therefore, in this paper, we aim to explore the importance of Māori perspectives in AI in education (Aled) development, highlight and argue a case for Māori perspectives and propose a framework by which these AI developments can be framed around with possible actionable steps also being proposed. By recognizing the significance of cultural perspectives, we can move towards a more equitable and inclusive future where indigenous voices are heard, valued, and incorporated in the design and deployment of AI technologies.

Current State of Indigenous Aled

Given that AI itself is a relatively young field, the inclusion of mātauranga Māori (Māori Knowledge) in the design, development and implementation of AI for Māori is understandably still in its infancy. Colloquially known as ‘Māori AI’, the aim of these AI applications are to be built and designed with Māori perspectives and cultural values from the ground up. This, will in turn, manage and minimise potentially harmful biases. TUA Hine and TUA Tāne was launched in May 2023 as a collaboration between Hāpai Te Hauora and Te Whatu Ora Health New Zealand. TUA Hine and TUA Tāne are avatars of an online chatbot that will help Māori who wish to quit smoking by being an ‘online hoa’. These chatbots will be available 24/7 on Facebook Messenger, sending daily check-ins, tips and distractions to provide support through the first 30 days of stopping smoking. This is in addition to the Qitly chatbot which had been the initial chatbot operating on Facebook Messenger, serving the same function, but not targeted for Māori users (“Qitly - Facebook Messenger Chatbot,” n.d.). Although not a ‘pure’ AI in the sense that it can generate its own learning and logic system, TUA stands as a good start to how mātauranga Māori can be tapped on to provide an AI enhanced service for Māori people. Focusing more on the application of AI in education (Aled), there has also been some application of mātauranga Māori in the use and implementation of software, more specifically Māori language applications. These applications aim to teach the Māori language using more traditional algorithms, in the form of natural language processing (NLP) applications. Many current day ‘Māori AI’ and ‘Māori Aled’ applications are essentially traditional AI with Māori characteristics. These AI applications have been developed without a Māori perspective, but by simply applying a Māori language filter or elements of a Māori passing user interface (UI) on it.

Encouragingly, some positive signs should also be noted. There has been increasing discussions on how Māori perspectives and AI can be integrated and co-exist. The Māori AI Wānanga, hosted by the AI Institute, TAIAO and Tikanga in Technology project teams at the University of Waikato in August 2022 held workshops and discussions around understanding AI, decolonising algorithms, Māori involvement in AI and where AI in Aotearoa should be heading. The AI Forum of New Zealand has also recently set up Kāhui Māori Atamai Iahiko (Māori Artificial Intelligence Advisory Panel) to ensure that there will be a Māori voice in the AI development scene in New Zealand as well.

Current Māori Learning Model as an Aled framework

One of the more prominent Māori learning models used in NZ is the Te Whare Tapa Whā model. Te Whare Tapa Whā, originally conceived as a model for health and well-being (Durie, 1998), is one of the preferred indigenous models of learning and is encouraged by Ako NZ and te tahuhu o te matauranga (the Ministry of Education) (Ou, 2020). Secondary schools such as Te Kura o Hau Karetu and pre-primary schools such as Te Kura Kaupapa Māori o Te Rito have also adopted the Te Whare Tapa Whā model, both of which indicating that the model has had positive impacts on the the student population (“Te Whare Tapa Whā — the Four Sides of Wellbeing” 2021). As it currently stands, it is adapted as an educational framework that integrates indigenous perspectives and AI technology to underscore the importance of combining multiple dimensions to facilitate comprehensive learner development, while also considering the ethical and cultural implications of AI implementation. This model encompasses the following dimensions:

- **Taha Tinana (Physical Dimension):** The physical dimension recognizes the significance of physical well-being in the context of AI-driven education. It emphasizes creating a supportive environment that promotes healthy lifestyles, physical activity, and adequate rest, while also considering the ethical implications of AI technology on physical health and safety. This includes ensuring ākonga (students) have access to appropriate AI tools and technologies that enhance physical learning experiences and enable personalized support.
- **Taha Hinengaro (Mental and Emotional Dimension):** The mental and emotional dimension emphasizes the promotion of students' mental well-being, emotional resilience, and cognitive growth in the context of AI-driven education. It involves considering the ethical use of AI to support students' mental health and emotional well-being, while also addressing concerns related to privacy, data protection, and algorithmic bias.
- **Taha Whānau (Family and Social Dimension):** The family and social dimension acknowledges the importance of strong connections between students, their families, and the wider community in the context of AI in education. It recognizes the need to involve families and communities in discussions around AI implementation and its impact on cultural values, identity, and community well-being.
- **Taha Wairua (Spiritual Dimension):** The spiritual dimension encompasses the spiritual well-being, cultural values, and identity of students in the context of AI-driven education. It recognizes the importance of incorporating indigenous perspectives, knowledge systems, and cultural practices into AI design, development, and implementation. This includes ensuring that AI tools and technologies are aligned with cultural values, respect cultural protocols, and empower students to connect with their cultural heritage and identity.

Whilst Te Whare Tapa Whā as an educational model within the context of AI, educators may potentially provide a comprehensive approach to student learning and well-being that is culturally responsive, ethically grounded, and inclusive, it is not explicitly grounded in rigorous pedagogical theories or research-based instructional practices. As such, Te Whare Tapa Whā as an educational model may suffer from:

- **A lack of explicit pedagogical strategies:** Te Whare Tapa Whā primarily focuses on the dimensions of well-being and the integration of cultural values, but it may not provide specific guidance on instructional strategies or teaching methods that support effective learning outcomes. While the model acknowledges the importance of holistic development, it may not offer concrete pedagogical approaches or evidence-based practices to guide educators in designing learning experiences, such as how to align curriculum content, learning objectives, and assessment methods that reflect the principles of the model.
- **Insufficient consideration of technological dimensions:** One other weakness is that Te Whare Tapa Whā does not take into consideration the advancements in technology in education. An expansion of the model could incorporate an additional dimension specifically focused on technology. The

technological dimension would encompass ethical considerations, data privacy, algorithmic transparency, and the responsible use of AI tools and technologies within educational contexts.

Proposing a Māori-Aled Framework

As such, we would like to propose a model that takes into account the relationships between the learner, teacher, learning community and AI. This model is informed by the Student-AI collaboration model (Kim et al., 2022) and underpinned by Te Whare Tapa Whā.

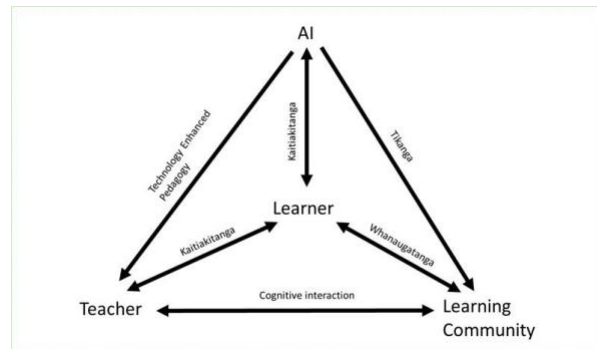


Figure 1: Proposed Māori-Aled Framework

The framework posits that there are relationships between each of the various elements and that each of these relationships have to be informed by Māori values and Mātauranga Māori. The AI-Teacher relationship, whilst dynamic, holds the potential to transform the field of education by providing timely support information and analytics to teachers; automating administrative tasks, and further supporting teachers to provide a more personalized instruction and student engagement (Koh et al., 2022). Expanding further on the popularly adopted Te Whare Tapa Whā model, this framework explicitly incorporates more aspects of Tikanga Māori (Māori values and customs) to highlight the importance and significance of tikanga Māori in the building and guiding of relationships. Additionally, it adds the AI dimension in the discussion of how the relationships between the ākonga (learner), kaiako (teacher) and community can be and should be built and maintained.

The relationship between the learning community (the social aspect of learning) and AI has been an emergent field of study (Salas-Pilco, 2020). AI has the potential to support collaborative discourses on an AI enhanced platform, providing information and prompts to guide student discussions and to maintain focus on the topics at hand. Students are also encouraged to share personal experiences and perspectives in a curated and safe wānanga (learning space). This framework also takes into account how learning spaces have evolved to include digital learning spaces and expands on learning with tikanga Māori, compared to the Te Whare Tapa Whā model or other online learning models. As this directly involves the use of AI on ākonga (students), the development of the AI functions that deal in this area must be guided by Tikanga. Tikanga calls for AI technologies to be developed and deployed in ways that respect and uphold Māori values and cultural practices, and that avoid imposing Western or non-Māori frameworks onto Māori contexts.

The relationship between the teacher and the learning community is one that is already traditionally present in Māori epistemology. The transmission of knowledge from a kaiako to ākonga is one that is built on a student-teacher relationship and is often termed as cognitive interaction between the teacher and the classroom (Chi & Wylie, 2014). Finally, the relationship between the individual ākonga (student) and the kaiako (teacher) as well as the relationship between the ākonga (student) and AI should be reflected as well. This is a two-way relationship that is must be bounded by the principle of manaakitanga (honouring the divine dignity of the individual). This is especially important given the fact that both AI and the kaiako play the role of presenting information and passing knowledge and values to the individual. In this principle, it calls for AI technologies to be developed and deployed in ways that prioritize the well-being and dignity of individuals and communities, and that do not perpetuate harmful stereotypes or biases.

Challenges

Integrating Māori perspectives with developments in AI and machine learning poses several challenges due to the differences in epistemology, ontology, and philosophical approaches between Māori knowledge systems and Western education frameworks (Lewis et al., 2020;). Firstly, Māori perspectives regarding sources of knowledge generally focus on oral traditions, intergenerational knowledge, and ancestral wisdom (Sadler, 2007; Salmond,

1985). In contrast, the philosophy underpinning AI tends towards Western empiricism, learning as an individual endeavour, and prioritization of written documentation (Ganascia, 2010). This dichotomy is especially evident in the way that AI is perceived, where a distinctive Māori may generally view AI as part of nature, and may view this as something to be respected, rather than exploited (Lewis et al., 2020). Secondly, AI focuses on learning as a dichotomy between subject (individual) and the object (experience, idea, etc.) (Woods, Dell, & Carroll, 2022). In contrast, Māori perspectives emphasize interconnectedness, relationships, and holistic ways of knowing that go beyond the individual-object dichotomy (Bastien, Coraiola, & Foster, 2023). Knowledge is viewed as an active engagement with the environment, with the community, ancestors and even spiritual dimensions. Learning is thus experienced emotionally within an interconnected web of relationships involving reciprocity and collective participation. This can be contrasted with the more algorithmic nature of AI's interpretation of reality. Lastly, the integration of Māori perspectives with AI requires the acknowledgement of these different philosophical approaches in addition to creating a bridge between these seemingly different philosophies (Saha et al., 2021). Acknowledging the differences allows us to explore the underlying assumptions embedded within AI such the prioritization of learning as purely individual process and the overreliance on rationality (analytical thinking and objective data) over other forms of knowing such as experiential learning highly valued in Māori culture (Canipe & Tolbert, 2016). In the context of AI and AIED, it is imperative for scholars and practitioners to acknowledge the limitations of a purely rational and individualized perspective. While rationality and objective data play a significant role in the development and application of these technologies, an exclusive focus on these aspects neglects the richness and complexity of human experiences and alternative ways of knowing.

Future Direction and Work

We summarize some future research directions on addressing the challenges in the integration of Māori perspectives with AIED:

- **Cultural Responsiveness in AI Education:** Researchers can investigate how AI can be designed and implemented in a culturally responsive manner, taking into account diverse knowledge systems and perspectives (Lewis et al., 2022). This research could explore the development of AI systems that incorporate Māori values, oral traditions, and intergenerational knowledge to enhance educational experiences for Māori learners and promote cultural continuity. Furthermore, this area of research engages both pedagogical and AI researchers particularly in exploring the relationship between subjective-objective learning dichotomies with experiential-based pedagogies.
- **Holistic Learning Approaches:** Researchers can explore alternative learning approaches that go beyond the individual-object dichotomy and embrace interconnectedness, relationships, and holistic ways of knowing (Williams & Shipley, 2021). Furthermore, there are plenty of opportunities to investigate how AI technologies can support collaborative and community-based learning, fostering a sense of reciprocity, collective participation, and emotional engagement within educational settings.
- **Indigenous Knowledge Systems and AI Ethics:** Researchers can examine the ethical implications of integrating indigenous knowledge systems with AI and machine learning (Lewis et al., 2020). Researchers could also focus on how to address issues of implicit bias, discrimination, and cultural appropriation in AI algorithms and systems when incorporating Māori perspectives. This research stream could contribute to the development of ethical guidelines and frameworks that promote the respectful and responsible use of AI technologies in education.
- **Indigenous Data Sovereignty:** Scholars can investigate the concept of indigenous data sovereignty in the context of AI for higher learning (Kukutai & Taylor, 2016). Furthermore, there is a need to explore how Māori communities (and by extension other Indigenous groups) can exercise control over their data and ensure its use aligns with their cultural values and aspirations.

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