



TE WHAKAPAIPAI I TE HANGARAU PUTANGA MO TE HAUORA HINENGARO MAORI

Harnessing Emerging Technology
for Maori Mental Health

ETHAN HICKS



INTRODUCTION



In recent years, there has been a growing recognition of the critical intersection between mental health and emerging technologies. As complex challenges posed by mental health disorders for diverse demographics increase, the potential of technology to provide innovative solutions and support systems has become increasingly evident. This research proposal seeks to explore and contribute to this growing field by investigating the potential design and implementation of emerging technologies aimed at supporting mental health; more specifically focusing on improving outcomes for Maori.

In Aotearoa New Zealand, Maori experience disproportionately high rates of mental health issues compared to non-Maori. Rangatahi Maori while experiencing similar rates of depressive symptoms (Maori 13.9%, NZ European 12.1%), experience considerably higher rates of attempted suicide (Maori 6.5%, NZ European 2.7%), and much poorer general wellbeing (Maori 10.5%, NZ European 6.8%) (Williams et al., 2018). Despite advances in treatment and awareness, a complex combination of historical, socio-economic, and cultural factors have led to a pervasive sense of trauma and disenfranchisement for Maori. Ultimately this means traditional western approaches to mental health care often fall short in addressing unique needs of Maori, highlighting an urgent need for new solutions.

Emerging technologies offer promising avenues to bridge this gap by providing tailored mental health support that respects and integrates Maori cultural values and practices. Technologies such as mobile health (mHealth) applications, virtual reality (VR), and artificial intelligence (AI)-driven platforms have the potential to deliver personalised, accessible, and effective mental health interventions. These technologies could be designed to align with holistic Maori health models that emphasise these values to produce better mental health services for Maori across NZ.

However, realising the full potential of emerging technologies in Maori mental health care requires careful consideration of various factors, including usability, accessibility, privacy, and most importantly cultural sensitivity. Design plays a crucial role in shaping the effectiveness and acceptance of these technologies among the Maori population. By applying principles of human-centred design and incorporating insights from psychology, Maori culture, and neuroscience, designers can create solutions that are truly effective in helping the key needs and preferences.

This research aims to bridge the gap between mental healthcare and Maori. It seeks to understand how mental health is viewed in Maori communities, what existing digital health tools are currently out there, and how they could be adapted or developed to address mental health in Maori individuals. The significance of this research lies in its potential to not only enhance the mental health of Maori but also to serve as a model for integrating indigenous perspectives into digital health solutions globally.

As a person with whakapapa (Maori genealogy), with many members of family that have suffered the effects of mental health, the central topic of this study speaks very deeply to me as it highlights my own positionality and hopes for innovation in the mental health field.

This proposal outlines the research objectives, methodology, and expected outcomes, setting the stage for a comprehensive study on improving mental health outcomes for Maori through the innovative use of emerging technologies

CHALLENGE/PROBLEM

The ultimate aim of this research is to investigate how emerging technologies could better address mental health problems for Maori by creating more culturally sensitive products, environments, or services that can better help the mental wellbeing of Maori individuals.

Thus the main How might we question this research addresses is:

“How might we use emerging technologies to produce impactful culturally significant solutions to address mental health in NZ Maori.”

INQUIRIES

To address this we must understand:

- Maori views on mental health.
- How emerging technologies are currently employed to address mental health and wider problems.
- How mental health is currently addressed in NZ, and why help for Maori is falling short.
- Where there are opportunities to combine Maori Values and emerging technologies to improve help for Maori.
- What avenues in the field of Emerging tech can best tend to Maori mental health.

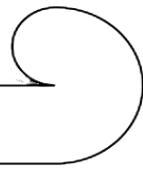
BACKGROUND and CONTEXT

Strong mental health is an extremely important part of an individual's well being. It consists of not only science of the body and mind, but also cultural, spiritual, and communal dimensions of oneself. Today Maori continue to experience disproportionate rates of mental health issues, and yet despite this well documented statistic there is little evidence of why this problem persists and how it can be solved (Williams et al., 2018). What is clear however, is that the impact of colonisation and intergenerational trauma on Maori has contributed to not only a loss of language, but a loss of meaning of being Maori (Williams et al. 2018).

Traditional western methods of psychology, while having made large strides in the biological field of mental health, have frequently failed to acknowledge cultural and holistic aspects (Pargament, 2007). This failure can be especially detrimental to culturally and spiritually indulged people such as Maori, where values in relationships such as whanau (family) and whakapapa (genealogy) play an extremely important part in one's livelihood. This statement is supported by previous research that found strong ties with one's own cultural identity produced positive results in mental health outcomes (Brougham & Haar, 2012). Despite this, the impact of traditional psychology methods continuing to ignore cultural and spiritual dimensions, combined with the devaluation of cultural identity through colonisation and dominant western perspectives, have produced an environment where Maori are extremely susceptible to mental problems (Rajaei, 2010)(Williams et al., 2018).

The underrepresentation of these aspects in the field of mental health care highlights the need for new approaches that better tend to the unique needs of different cultures. Emerging technologies such as virtual reality, mobile health, and artificial intelligence, offer promising opportunities to create innovative solutions that address the prevalent limitations in Western practice for Maori. By combining Maori values and these technologies, there is the opportunity to provide Maori with accessible and engaging care that addresses the cultural and spiritual aspects along with psychological and emotional aspects of an individual's wellbeing, resulting in better care for Maori across NZ.





LITERATURE REVIEW

Maori context and te whare tapa wha

In order to truly understand and address the mental health needs of Maori it is critical to understand the cultural context. Traditional Maori society was situated around whanau (wider family), then came hapu (subtribe), and iwi (tribe). Whakapapa is extremely important to Maori, and because of this each iwi had Tohuka (experts) that would preserve and pass on this knowledge (Rochford, 2004). These Tohuka would trace lines of descendants from the founding parents, Rakinui (sky father) and Papatuanuku (earth mother), and from their children who were gods and were all things in the environment both inanimate and animate (Rochford, 2004). The clear emphasis on the importance of relationships both with the environment and people, show a reflection of spiritual and physical belief in all things. Maori in a different way to western approach, based their structures around interdependence and interconnectedness. This way of life created a form of public health that was based on valuing close and intimate relationships between the natural environment and people.

The impact of Pakeha arrival would unfortunately damage these structures, as the individualist, material culture of the english migrants would clash with the spiritual culture of Maori leading to many disagreements that still have impacts on the Maori health problems seen in statistics today.

Investigations into mental health problems in Maori have highlighted the importance of Maori principles, and more so the shortfalls of westernised psychology. Te Whare Tapa Wha, a holistic health model developed by Sir Mason Durie, emphasises the balance of four key dimensions: Taha Tinana (physical health), Taha Hinengaro (mental health), Taha Wairua (spiritual health), and Taha Whanau (family health)(Durie, 1985). While this research will focus on the mental dimension of the model, it is emphasised in the literature how the four are intertwined in overall well-being. Essentially meaning that a change in strength in one dimension can simultaneously affect our strength in the other dimensions. Durie speaks of the World Health Organization's (WHO) three aspects emphasised in their definition of health: physical, mental and social, and its ability to overlook the spiritual and familial dimensions of health mentioned in his own model (Durie, 1985).

Western services tend to focus narrowly on symptom alleviation without addressing broader cultural and holistic contexts of health. For instance, Maori patients who value collective approaches to healing may not resonate with individual therapy and pharmacological treatments. As a result, Maori are more likely to be disengaged with these services and experience unmet mental health needs (Came, 2014).

Frameworks such as Te Whare Tapa Wha therefore are extremely valuable in developing culturally appropriate interventions. By integrating Maori principles into mental health services, practitioners can ensure all dimensions are addressed. For example, incorporating spiritual practices, such as karakia (prayers) and connecting with tupuna (ancestors) can enhance relevance and effectiveness for Maori. Additionally, involving whanau in the treatment process can provide critical support and reinforce cultural identity and community ties. These tools work on different sides of health to western approaches, and account for a crucial part in the lives of people - the presence of Mana. Mana has previously been translated as prestige or self-esteem. But really it is a state of high power and spiritual wellbeing, meaning high levels of health without ego. Ultimately to carry mana is to know high health (Durie, 1985).

These studies show that a more culturally thoughtful solution that can include Maori values and principles can better help mental health problems among Maori in NZ. However it is important to acknowledge the limitations of research especially on Maori, highlighting the need to further explore the views of different Maori communities, ensuring that solutions are culturally grounded and responsive to the needs and preferences of the people they are intended to serve. This approach aligns with the principles of self-determination and tino rangatiratanga (self-governance), which are central to Maori aspirations for health and well-being (Smith et al., 2020).



Emerging technologies in mitigating mental health problems

Mental illness is defined as a change in a person's feelings, behaviour or thinking that causes stress and difficulty carrying out daily activities (NIH, 2007). It affects millions around the world, and has put a large strain on the current public health system (Comer, 2015). Despite large advances in science, and new innovations in medication and psychotherapy, the vast majority of people suffering from mental health issues are not receiving proper treatment (Comer, 2015). This can be attributed to a range of barriers that obstruct accessibility, availability and acceptability of care, such as inadequate numbers of health care professionals. The shortages in the mental health workforce, especially in rural areas, leave around 50% of the mental illness population without a mental health professional within their area (Comer, 2015). This can be extremely damaging to vulnerable populations such as Maori, in which a large portion are situated in rural regions.

With the growing recognition of this issue, emerging technologies such as Mobile Health (mHealth) applications, virtual reality (VR), and artificial intelligence (AI) are being employed to bridge the gap between people with mental health illnesses and mental health care. They have the potential to provide far more accessible and adaptable solutions that can expand to clients in the very places that are of the most concern (Comer, 2015). For example the use of mobile phone technologies is becoming increasingly popular through apps, targeting a range of mental health issues and are currently available for purchase directly online. These applications are being applied in a number of areas, from assessment all the way to treatment of certain diagnoses (Jones et al, 2015). Despite many of these current applications taking the right first step, many of the applications use low-tech solutions like phone calls or simple messages (Kaonga & Morgan, 2019). This leaves opportunities for higher tech solutions, and to more extensively grow how tech can be used in eMental health (electronic Mental Health) (Kaonga & Morgan, 2019).

Virtual Reality (VR), through the creation of interactive and immersive virtual spaces, provides an emerging opportunity for creating a new form of therapy. Currently it is still in its experimental stage, and is primarily being looked at as a tool for cognitive behavioural therapy (Kaonga & Morgan, 2019).

Studies such as that carried out by Cesa et al., 2013 where VR was used as a tool to enhance cognitive behavioural treatment, specifically in binge eating and obesity, found that VR does have the ability to notably reduce mental illness symptoms, in this case in binge eating disorders. This was due to the heightened immersion in therapeutic practices created by VR, which elicited higher engagement with tasks, and thus better success in cognitive treatment. Additionally VR also allows practitioners to immerse individuals in real world situations to carry out assessments that emulate the real world. This way patients needs and problems can be better understood and thus their treatment, more effective (Bell et al. 2020).

Artificial Intelligence (AI), with its exceptional capabilities, such as handling large amounts of data, and recognising complex relationships and patterns allows it to be another potentially very useful tool in the Mental Health care field (Olawade, 2024). AI has the ability to identify risks, and apply interventions when needed, which can help to lift weight from healthcare systems. It can also help to detect mental health symptoms early, apply virtual therapy platforms, and forecast potential concerns through analysing speech, text, health records and facial expressions. With the aid of these models, AI can help personalise treatment plans, and apply these early and efficiently (Olawade, 2024). By offering continuous support, these devices can also reach wide ranges of demographics while tailoring their approaches to different individuals at reduced costs - increasing availability.

The integration of mobile health applications, VR, and AI has risen in recognition over recent years, with its ability to better address the outstanding number of mental health illnesses in the modern world. These treatments can create a multimodal approach that better target demographic groups through personalised treatments, and better patient engagement. The incorporation of these technologies with Maori values and ideals that have shown to aid the mental well being of Maori, can create more human-centred, and personalised treatment benefiting the four dimensions of Te Whare Tapa Wha.

PROCESS and METHODS

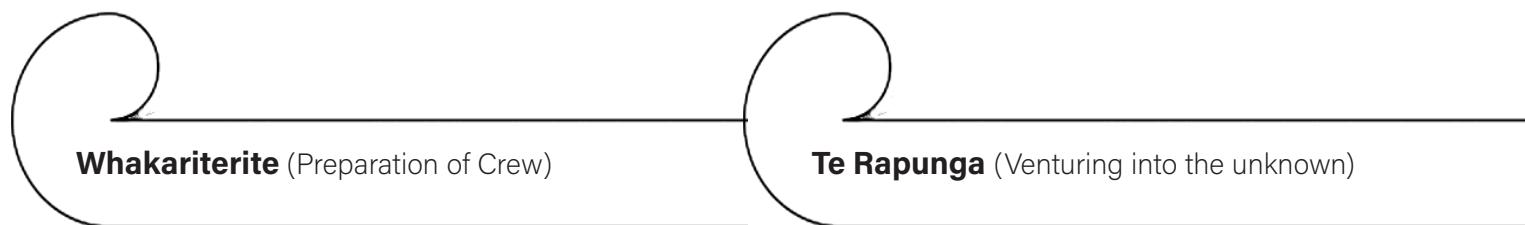
To develop truly culturally significant and effective mental health interventions for Maori using emerging technologies, this research project will adopt the **Hautu Waka** framework. Hautu Waka, a culturally grounded design process, draws on traditional Maori navigation principles, emphasising collective effort, adaptability, cultural alignment, and importantly emphasises a Maori human-centred approach. This process ensures that the project is guided by Maori values and perspectives, promoting community engagement and listening to those you are designing for.

Overview of the Hautu Waka Framework

The Hautu Waka framework consists of five key phases:

- **Whakariterite** (Preparation of Crew)
- **Te Rapunga** (Venturing into the unknown)
- **Te Kitenga** (Sighting tohu)
- **Te Whainga** (Deciding which path)
- **Te Whiwhinga** (Taking a closer look)
- **Te Rawenga** (Collect, reflect, acknowledge tohu)

Each phase incorporates specific methods and activities designed to ensure cultural relevance, community involvement, and iterative development.



Objective: Aligning our purpose, identifying skill sets, what resources are needed, and what can be left behind.

Methods:

- Skills Matrix - Identify the skill sets needed for the journey - assess what skills I currently possess and what other resources may be needed.
- Needs plan - Come up with a necessary plan to fill any gaps in skills.

Activities:

- What prepared us for this mahi?
- What did we recognise as current system conditions and capabilities?
- What skill sets were identified as needed on this journey?
- What was decided to leave on shore - to ensure best chances of success?

Objective: In the Te Rapunga phase, the focus is on drawing from past experiences and collective knowledge to navigate uncertainties and recognize emerging signs (tohu) that will guide the project. This stage emphasises leveraging capabilities, mindsets, and processes that enable the team to be attuned to subtle indicators that can inform and shape the project's direction.

Methods:

- Reflective Journals and Knowledge Sharing
- Bias and gaps in knowledge summary

Activities:

- What key learnings from previous projects could be applied?
- Maintain reflective journals documenting insights, experiences, and observations throughout the project.
- What knowledge will support spotting tohu
- What are the processes, mindsets, and capabilities that support us spotting emerging tohu.

Te Kitenga (Sighting tohu)

Objective: In the Te Kitenga phase, the focus is on recognizing and interpreting tohu (signs or signals) within the system, understanding the current landscape, and identifying opportunities for change. This stage involves attuning to the present conditions and leveraging collective knowledge to explore compelling alternatives to the status quo

Methods:

- System Mapping and Environmental Research - Understand landscape and context, and identify existing tohu within the mental health system for Maori.
- Identify tohu that indicate potential future directions

Activities:

- Carry out ethnographic fieldwork, including participant observation and in-depth interviews.
- Conduct contextual inquiry sessions.
- Analyse surveys, interviews, research and observations to identify patterns and emerging tohu.
- Hold interpretation sessions with M^āori to contextualise findings
- What opportunities are out there?
- What was decided to leave on shore - to ensure best chances of success?

Te Whainga (Deciding which path)

Objective: In the Te Whainga phase, the focus is on digging deeper into the research and exploring the strongest tohu to set the journey path. This stage involves testing ideas, researching alternatives, and identifying mechanisms and actions that will support system shifts and tangible improvements in Maori mental health.

Methods:

- Analysing which emerging technologies are best suited to culturally tailored mental health based on the previous stage.
- Prototype and Test - Low fidelity prototypes of a number of potential solutions to quickly gather feedback - test with Maori.
- Co-design - Collaboratively design with Maori community members to refine certain solutions
- Systems Mapping: Create systems maps to visualise how proposed interventions interact with existing systems and identify leverage points.
- Impact Assessment: Assess the potential impact of proposed solutions on the mental health system and broader community.

Te Whiwhinga (Taking a closer look)

Objective: The Te Whiwhinga phase is about taking decisive action based on the clear tohu (signs) that have emerged. In this stage, we focus on exploring and iterating the identified solutions and working towards the collective vision. We leverage our gathered knowledge and direction to carry out the necessary mahi (work), ensuring that our interventions are effective and sustainable.

Methods:

- Chosen prototype: Based on gathered feedback and other knowledge gained through the process, pick the strongest solution to advance with.
- Ongoing iteration: Iterate the solution further to ensure it is of its maximum potential - Co-design with M^āori and other necessary stakeholders.
- Implementation of Prototype: Test the refined prototypes with necessary target users.

Activities:

- Launch the digital mental health tools in collaboration with community partners.
- Develop and apply measurement tools such as surveys, interviews, and focus groups.
- Gather feedback from users and stakeholders to make necessary adjustments.
- Work closely with stakeholders to align efforts and integrate solutions into broader systems.

Te Rawenga (Collect, reflect, acknowledge tohu)

Objective: Te Rawenga is the phase dedicated to collecting, reflecting on, and acknowledging the tohu (signs) encountered throughout the journey. This is a time to celebrate the achievements, reflect on the learnings, and share these insights with others as a guide for future efforts. By documenting and circulating our experiences and findings, we ensure that the knowledge gained is preserved and made accessible to others who may embark on similar paths.

Methods:

- Comprehensive Documentation: Ensure the journey, findings, and outcomes are all captured accurately and include all of the insights learned.
- Reflective Practice: Reflect on each stage as the process goes on, and finally reflect on the overall journey you have just embarked on.
- Celebration and acknowledgement: Celebrate achievements with participants and stakeholders.

Activities:

- Compile and organise all project documentation, including data, feedback, and reflections.
- Reflect on the journey and extract key learnings.
- Host events to celebrate milestones and achievements and recognize and honour the contributions of community members, stakeholders, and team members.

ETHICAL CONSIDERATIONS

Ensuring ethical rigour in my research is extremely important, especially given the sensitive nature of mental health, the cultural context involving Maori communities, and the dangers of privacy breaches in using emerging tech. My approach will be guided by principles of cultural sensitivity and respect, informed consent, confidentiality and privacy, minimising harm, equity and fairness, accountability and transparency, and reciprocity.

Cultural Sensitivity and Respect are central to my research approach. I will prioritise manaakitanga, the Maori value of hospitality and kindness, by building and maintaining respectful and caring relationships with Maori participants and communities (WSP, 2024). Adhering to tikanga, or Maori customs and practices, throughout the research process will honour cultural values and protocols, and the Hautu Waka framework will help facilitate this. This includes engaging with Maori cultural advisors to ensure my research design and implementation are culturally appropriate and conducting meetings with Kaumatua (Maori elders) and community leaders to seek guidance and approval.

Informed Consent will be ensured through transparency and voluntary participation. Participants in my research will be fully informed about the purpose, procedures, and potential impacts of the research. I will provide a clear information sheet and consent form in both English and Te Reo Maori. Culturally appropriate methods, such as kanohi ki te kanohi (face-to-face) meetings, will be used to explain the research and obtain consent, ensuring the participants fully understand their involvement and can withdraw at any time without consequence.

Confidentiality and Privacy are essential to protecting the participants' rights. I will safeguard the privacy of participants by keeping their data confidential and using it solely for the research. Data will be stored securely with access limited to myself and other people involved in the research, and various codes will be used to ensure anonymity in all documentation and reports. This approach ensures that individual participants cannot be identified in any publications or presentations unless they wish to be.

Equity and Fairness will guide my efforts to ensure that the research benefits and burdens are distributed fairly, avoiding any form of discrimination or bias. Inclusivity is key, and I will actively involve a diverse range of Maori voices, including those from different age groups. Strategies will be developed to reach and include underrepresented groups within the Maori community, ensuring that the research findings and benefits are shared equitably, and are impactful.

Accountability and Transparency are crucial for maintaining integrity in the research process. I will embrace kaitiakitanga, the concept of guardianship, by taking responsibility for the supervision of the research process and outcomes. Honesty and transparency will be maintained in all aspects of the research, including methodologies, journaling and documentation. Regular progress reports will be provided to selected participants and stakeholders, and an advisor through my tutors who will oversee the ethical conduct of the research.

Finally, **Reciprocity** will ensure that the research provides benefits to the Maori communities involved and closely follows the Hautu Waka framework. This concept of utu, or reciprocity, means that I will share research findings with participants through hui (meetings). Additionally, I will help with any community projects or initiatives around Marae as a way to give back to participants of the research and community.

By adhering to these ethical principles, my research aims not only to achieve its objectives but also to honour the Maori communities involved. This ethical approach will help me to conduct the research in a manner that is respectful, ethical, and beneficial to all stakeholders.

ASSUMPTIONS and LIMITATIONS

In conducting this research, I will operate under several key assumptions that underpin our approach and methodology. Additionally, this study like any other is subject to limitations which may affect the interpretation of findings. Recognising these limitations is crucial to contextualise the findings and understand the applicability and scope of the research.

Limitations

- Generalisability: While my research is deeply rooted in the cultural context of Maori communities, this specificity may limit the generalisability of our findings to other cultural groups. The unique cultural, social, and historical factors influencing Maori mental health may not be directly applicable to other populations. Additionally, selection of participants may have particular characteristics, and so may not be representative of the wider Maori community in a smaller scale.
- Resource Constraints: The success of my research is heavily dependent on the availability of resources, including technological tools, and human expertise. Resource constraints may limit the depth and breadth of the exploration and the extent to which I can implement and test prototypes and proposed technological solutions.
- Ethical and Cultural Sensitivity: Working within Maori communities requires a high level of ethical and cultural sensitivity. Any missteps in respecting cultural protocols could harm relationships and the validity of my research. This means continuously engaging and adapting, which can be time-consuming and complex.
- Participant Variability: Mental health is influenced by a number of factors, and there is significant variability among individuals in terms of how they experience and report mental health issues. This variability can make it challenging to measure the real impact of the designs accurately and consistently.

Assumptions

- Relevance of Emerging Technologies: 1 assumption is that emerging technologies such as AI, VR, and mobile health applications are relevant and can be adapted effectively to address mental health challenges within Maori communities. This assumption is based on the literature and preliminary findings from similar contexts I found.
- Cultural Adaptability: Another assumption is that these technologies can be culturally adapted in ways that are meaningful and respectful to Maori values and traditions. I believe that with proper involvement of Maori participants and advisors, these adaptations can be effectively implemented.
- Community Engagement: Maori communities will be willing to engage with the research process and that there will be sufficient interest and participation to gather useful data. This assumption is critical for the collaborative and participatory nature of the research.
- Positive Impact: The integration of emerging technologies will have a positive impact on mental health outcomes. This is based on prior research indicating the potential benefits of technological interventions in mental health care.

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