



Pūhoro Stem Academy - Phase one evaluation summary

About Pūhoro

Launched in 2016, Pūhoro was developed in response to national low engagement of Māori in STEM related career pathways that subsequently leads to lower numbers of Māori representation in the science, technology and innovation sector in Aotearoa. Pūhoro seek to change this space and recognise that a STEM workforce is required for an innovation focussed future society.

The goal for Pūhoro is to transform national statistics on Māori rangatahi engagement and success in STEM (science, technology, engineering and mathematics) and advance Māori leadership and capability to deliver globally.

The programme aims to reverse the low numbers of Māori representation in science and technology industries across Aotearoa by partnering with secondary schools to operate STEM Academies to increase Māori rangatahi engagement and achievement.

Pūhoro supports high schools to prepare their Māori science rangatahi for transfer to tertiary study and from there into employment. The programme works directly with secondary school rangatahi, whānau and teachers. Rangatahi are supported through mentoring, tutoring, study/exam workshops, study noho and wānanga. Participating secondary schools have been located across Manawatū, Bay of Plenty and South Auckland.



Pūhoro design objectives are to:

- Build a learning community that includes Māori rangatahi and their whānau, schools, iwi, industry and tertiary organisations
- Increase Māori rangatahi participation in STEM programmes
- Increase Māori rangatahi success in programmes that lead to careers in science and technology; and
- Introduce rangatahi and whānau to career pathways through industry partnerships

The Results

Independent research company, Ihi Research, recently conducted an evaluation of the 2016 Pūhoro Year 11 Māori rangatahi cohort, which emphasised the important effects the programme is having on Māori rangatahi engagement and achievement in STEM.

Key enablers of engagement were tied to important cultural values such as whānau, whakapapa, whanaungatanga, tuakana-teina, ako and manaakitanga that are deeply embedded in the programme.

Results showed a core enabler of engagement was the Pūhoro kaupapa whānau approach, whereby participants were viewed as whānau members with individual and collective responsibilities.

Embedded within the kaupapa whānau was a clear vision of improving Māori rangatahi engagement and achievement in STEM by honouring and celebrating rangatahi cultural identity. Māori rangatahi, whānau, teachers, industry stakeholders and Pūhoro staff members all spoke of the impact of being part of the Pūhoro whanau.

Enablers included opening Māori rangatahi eyes to new opportunities and possibilities in STEM, challenging stereotypes/ dispelling myths about Māori as underachievers in STEM, practical, relevant support and resources and Pūhoro leadership and committed staff.

A key enabler woven through the kaupapa whānau was Pūhoro leadership and staff commitment. The culture of Pūhoro and its leadership was unique in creating and sustaining a whānau approach within STEM; one that was committed to achieving its vision.

“Our son’s academic achievement and his cultural identity has grown as a result of the programme.”

Evaluation analyses demonstrated the many positive impacts the programme has had for participating Māori rangatahi, teachers and whānau. Key impact themes included:

- **personal impacts for Māori rangatahi**
- **impacts at high school (engagement and motivation)**
- **academic and career impact (achievement)**
- **impacts on Māori rangatahi opportunities (further studies and careers)**
- **impact on whānau experiences of education pathways**
- **other whānau impacts**
- **impacts on teacher/leader opportunities**

Other impacts included increased learning and confidence through ako (reciprocal teaching and learning). Past Pūhoro graduates could become involved in the programme, mentoring younger secondary school rangatahi. Evidence highlighted how Pūhoro created a bridge between university/tertiary resources and experts and secondary curriculum contexts. This access to expertise and its practical relevance was motivating to rangatahi and teachers and made it easy for them to engage.

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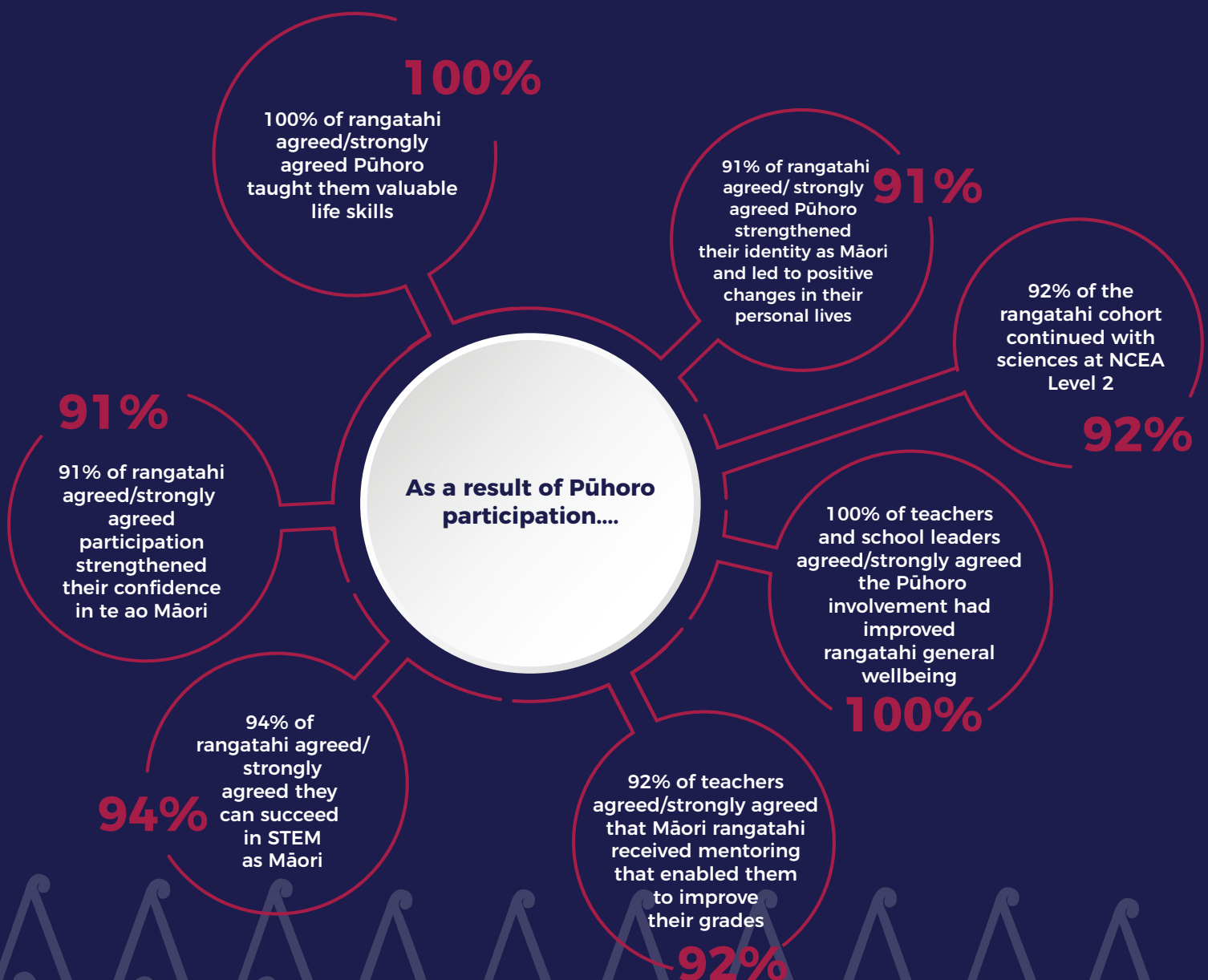
The Pūhoro kaupapa whānau provides an important, culturally embedded and holistic approach that strengthens Māori rangatahi engagement and success in STEM related pathways.

“We just can’t say enough good things about Pūhoro.”

Celebrating whakapapa and Māori role models’ success and achievement in STEM contexts is an essential part of the kaupapa whānau. The programme directly confronts low expectations and negative stereotypes of Māori rangatahi as underachievers in STEM. Analysis revealed Māori rangatahi were susceptible to such views and participating in the Pūhoro kaupapa whānau had a dramatic impact on Māori rangatahi identity as academic STEM achievers. Evidence emphasised without the intervention of Pūhoro, Māori rangatahi fall victim to negative stereotypes, reducing their belief that they can succeed in STEM subjects and careers.

Pūhoro has its own mātauranga and framework, ‘He waka eke noa’ drives design and delivery. This framework is crafted in the form of a waka with each specific kaupapa guiding the programme. This mātauranga guides the approach of Pūhoro to think differently about how to deliver the teaching/learning to make impact on the rangatahi and whānau. This places a real emphasis on:

- **Strengthening connections between the school, the rangatahi, whānau, educational institutions, industry and business stakeholders, research organisations and future employers**
- **Developing stronger and more meaningful relationships with rangatahi and their whānau**
- **Creating an environment where Māori rangatahi could engage in group learning and peer to peer mentoring, and**
- **Facilitating whanaungatanga amongst Māori rangatahi and creating a culturally responsive learning environment**



“Advancing Māori leadership and capability to deliver a world-class science community.”

Pūhoro analyses revealed ninety-two percent of the Pūhoro 2016 rangatahi cohort continued with sciences at NCEA Level 2 – despite the highest national drop-out rate for Māori rangatahi in science occurring between NCEA Level 1 and Level 2. In addition, a high-level of achievement, including merit and excellence endorsements for individual external achievement standards, was noted.



In 2017, 92 percent of Pūhoro Year 12 rangatahi achieved at least one science external achievement standard. There is clear evidence that Pūhoro had a positive impact by increasing Māori student participation and engagement in science supporting a change in academic trajectory for over two thirds of Pūhoro students.

Survey results indicated that rangatahi engagement in Pūhoro led to positive changes in their personal lives and improved their general wellbeing. Ninety-one percent of participants agreed/strongly agreed Pūhoro strengthened their identity as Māori; gave them more opportunities to interact with Māori role models (94%); they felt better prepared for NCEA assessments and exams (97%) and believed they could succeed in STEM as Māori (94%).

Of the 97 Year 13 Pūhoro students who left school in 2018, 87 percent intended to enter tertiary studies at a bachelor's degree level. This is a 74 percent increase over the national Māori average. Of this cohort nine percent moved directly to employment.

Whānau have seen improvements with 76 percent agreeing/strongly agreeing their child's involvement in Pūhoro led to positive changes in their personal lives and 77 percent agreeing/strongly agreeing it improved their child's wellbeing.

There is clear evidence from survey analyses that the Pūhoro STEM Academy has had many positive personal impacts for participating Māori rangatahi, teachers and whānau.



Pūhoro is an incredible organisation that truly is life changing. I will forever be grateful to everyone involved.

Themes for improvements

Themes that arose from participant interviews and surveys for improving the Pūhoro STEM Academy included:

- Expand the programme and ensure its sustainability
- Provide focussed professional learning and development (PLD) for teachers/school leaders and increase collaboration with schools
- More active support from universities and more targeted support for Māori rangatahi in their first year of study
- Further investigate whanau experiences with participating Pūhoro schools, educational institutions, stakeholders and enablers of engagement

Evaluation analysis also highlighted opportunities for further research, particularly the need for longitudinal research to track the experiences of the 2016 Māori cohort over time. Such research would give more insight into the enablers and barriers to Māori Pūhoro graduates' engagement in STEM studies/careers over time.

