

Kia ora koutou, Talofa lava, Ni sa bula vinaka

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I'd like to begin by placing our work within the national context

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Data includes:

- Maths and Computer Science
- AUT from 2000 onwards

Over this period:

- the 10,866 Maori and Pacific Nations (MPN) **non science** graduates made up 8% of all graduates
- the 1153 MPN **science** graduates made up 0.8% of all grads

Furthermore:

- the MPN **non science** PG:UG ratio was 1 to 2.7 (1 to 2 for non MPN)
- the MPN **science** PG:UG ratio was 1 to 3 (1 to 2 for non MPN)

Why are MPN less attracted to PG study than non MPN?

The ratio of MPN science to non science is 1 to 9.4, while the ratio of non MPN science to non science is 1 to 5.4

The attractiveness of science degrees to MPN appears to be considerably less than for non MPN. Why is this?

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(% Maori and Pacific university science graduates 1999-2003 with Maori and Pacific plotted separately)

Of the 1153 MPN graduates that comprised 5.7% of all **science** grads:

- 4.2% (852) were Maori
- 1.5% (301) were Pacific

That's 3 Maori to one Pacific

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(All universities graduates stats 1999-2003)

Summing up:

- 15% of all graduates are from science disciplines
- 5.7% of all science graduates are MPN
- 0.8% of all graduates are MPN science graduates

We should all be concerned!

There is also the yet unknown impact of recent NCEA level 3 scholarship results on groups already under-represented in maths and the sciences at senior school level.

I would now like to talk about the development of Awhina in the FoS @ Victoria.

We know that:

- Maori and Pacific peoples are under-represented nationally in science, and technology. They currently comprise 9.4% of our science degree enrolments, and that,
- coming from lower socio-economic backgrounds they are likely to have to face more difficulties

In order to assist our students to achieve at the highest level we first had to:

- objectively examine our past practices and
- make the necessary changes

The first step was to look holistically at our MPN students. So early in 1999, we undertook the first of our Awhina biennial surveys. We asked them to tell us:

- about themselves
- about their needs and aspirations and,
- how positive or negative our role had been

Key findings were:

- 40% were the first in their family to attend university. These students also reported both they and their family had poor prior knowledge of what university study entailed, and that they had difficulties balancing family and university commitments
- 75% were the first to study science
- 80% were studying science so they could contribute in the future to their communities
- nearly 50% of respondents studied science because of previous positive experiences with science at school
- About 70% were in paid work (from 2.5 to 45 hours per week). The work was poorly paid and totally unrelated to their studies.
- 80% identified at least one financial issue. 10% were supporting a child. 40% were providing financial support to whanau the most common perception was that the Faculty of Science could best help its MPN students by providing a supportive environment, scholarships and additional academic help

On the basis of this feedback we brought our students, their whanau and communities on board and in June 1999 established Te Ropu Awhina Putaiao (Awhina). We provided the following:

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Each year we worked alongside our students building on the previous year's successes and feedback, and now 6 years later, Awhina has become a comprehensive and effective support system that has also benefited non MPN science students and the wider community. Awhina continues to be fully funded by the Faculty (no SSG funding has been used) and the commitment to establishing a critical mass of MPN scientists & technologists and empowering MPN communities remains central to our strategic teaching and research goals. So what has been achieved?

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Our students have a strong sense of self-belief and have lifted their academic performance and aspirations through helping one another. They're telling us of the positive changes in their whanau, that they have a strong sense of belonging in the Faculty, that they are comfortable about asking for help and we know they are doing that sooner rather than later and we're watching them take flight and take up te reo and tikanga developments.

In 2003:

- 81% reported approaching academic staff for support, up from 53% in 1999
- 77% believe that staff have some understanding of MPN beliefs and cultures, up from 51% in 1999
- 61.5% believe staff understand how these may affect their study, up from 55% in 1999
- 75% of students listed Awhina as one of the three best things about studying science

However:

- only 27% reported positive experience with science at school down from 50% in 1999.

What is happening to MPN children at secondary level?

- 42% believed they had less time than they needed to study
- 58% had problems balancing university and whanau commitments
- 81% were in paid employment largely unrelated to their study, up from 67% in 1999
- 38% of students reported concerns over loans or debt, up from 20% in 1999

In the 1999 survey, the majority of students reported that they would like to progress to postgraduate studies but finance and grades were a barrier. Yet 4 years later, despite everyone's best efforts, these barriers remain for our students. We believe these concerns are not unique to our MPN students and to be successful, initiatives to increase MPN scientists, technologists and health workers must address these concerns.

We're measuring the effectiveness of Awhina through:

- biennial survey responses
- feedback from mentors, students, staff, whanau, MPN communities and supporters
- changes in whanau behaviour and aspirations
- student recruitment, retention, progression to grad and postgrad studies, degree completion time, student GPAs and
- scholarship successes e.g. FORST Tuapapa Putaiao Maori Fellowships, HRC

The trickle of MPN science school leavers reflects the untapped potential at secondary school level. Analysis of SC and UE results for the Wellington region revealed a high correlation between grades and decile rating. In 2000 we added Awhina Outreach and mentors (2nd year to PhD level MPN students) turned out to local low decile schools with high MPN enrolments (some were returning to their old school) to turn on the tap.

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With limited resources the following records were set:

- 1 NIWA Regional Science Fair prize
- 10 Porirua College pupils to the 2003 Otago Summer Science School and,
- in the 3 day 2004 Vic Science Experience for year 11 pupils, 45 of the 90 participants were MPN pupils from local low decile schools

There has been a positive shift in the perceptions of pupils and whanau towards:

- tertiary education
- tertiary education in science and technology
- careers in science fields

This work has also impacted positively on our mentors' personal and academic progress. We are determined to find the funding to maintain the momentum.

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The main lesson we have drawn from our Awhina experiences, is the importance of evidence-based focused initiatives, led by people with the correct skills, attributes and methodology, robust monitoring and evaluation and the provision of resources and long term funding to enable people to help themselves and others.

The under-representation of MPN peoples in the key areas of science, technology and health can no longer be ignored. The projected demographic changes over the next 20-30 years have placed the issues firmly on the table.

Education in the sciences is critical to empowering communities for the future. Empowered, healthy communities are a pre-requisite for ensuring equitable participation in the wider economy and wealth sharing. We need to find the solutions.

Tena koutou, tena koutou, tena koutou katoa.