ENGINEERING e2e EDUCATION TO EMPLOYMENT 47

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WORK WITH US TO HELP CREATE THE ENGINEERING GRADUATES THAT NEW ZEALAND NEEDS

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FROM THE CHAIR . . .

ASPIRING ENGINEERING STUDENTS *with excellent academic backgrounds are always going to university and enrolment numbers have risen steadily at most universities over the past four years.*

However, widening the pipeline to a range of careers in the engineering profession means looking beyond academic success to more practically oriented students who will excel in programmes offered by institutes of technology and polytechnics (ITPs). Often these students are more likely to struggle with pre-requisite maths and physics requirements but, if provided with appropriate support, can make excellent engineers.

Engineering e2e is exploring a co-requisite maths approach which has led to a highly successful state-wide programme redesign in the USA. Using this approach, community colleges and universities across Tennessee and Georgia report that student completion rates in developmental (remedial) maths have jumped from 12.3% to 51%. The key has been to enrol students directly into college-level courses that earn credit towards their qualification, while simultaneously providing extra learning support to get students up to speed. **Read more about this work.**

There are some excellent developmental maths programmes on offer in New Zealand that could provide a starting point for a co-requisite approach. A **case study of the maths programme at Weltec** *is on our website.*

We'll start a conversation and see where it takes us.

Sir Neville Jordan
Chair, Engineering e2e Steering Group

OTAGO POLYTECHNIC

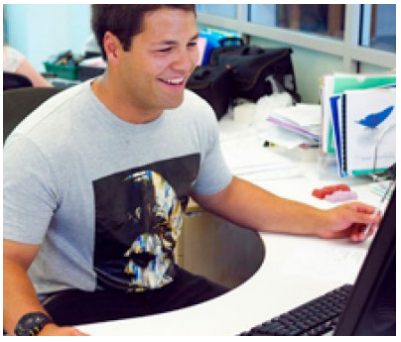
He Toki Iwi Industry Māori Engineering Workforce Partnership

Engineering e2e is funding Te Tapuae o Rēhua to work with whanau, communities, industry training organisations (ITOs), Ara Institute of Canterbury, Otago Polytechnic and engineering employers to more than double the number of Māori engineering graduates by 2021.

Programme leader Kym Hamilton says the He Toki team is building on existing relationships developed around trades training, and collaborating with local iwi Ngāi Tahu, industry and educators.

"We're looking to promote higher-value careers to Māori through the New Zealand Diploma in Engineering (NZDE) and Bachelor of Engineering Technology (BEngTech). Part of that involves looking at how schools can support Māori to take the subjects which will enable them to enrol in these courses."

The team is moving away from using a helpline to reach potential and existing students, in favour of face-to-face interactions. They have been using the Māori Job Squad (a Ngāi Tahu initiative) to support



OTAGO POLYTECHNIC

ARA INSTITUTE OF CANTERBURY

school students, primarily in Dunedin, Christchurch, Kaikoura and the West Coast, through promotional events focused on Level 6 and 7 engineering courses.

A major focus of the project, says Kym, is creating the culture change in tertiary institutions which will lead to more Māori enrolling in and successfully completing the NZDE and BEngTech. "It's an opportunity for polytechnics and institutes of technology to question practices which could be barriers to Māori participation in these courses."

"It would be easier to follow a cohort of students but we're trying to facilitate institutional change. As our relationship with Ara and Otago Polytechnic grows we're getting a lot of honesty from tutors and administrators along the lines of 'We do this, but we could do better.' These meetings have led to a new development – the project now includes upskilling people already in the workforce. Māori Job Squad events also focus on upskilling those working in civil construction to engineering."

Following ethics approval, Ara will shortly be surveying prospective, current and past Māori engineering students and Otago Polytechnic will do the same. The surveys will consider student opportunities and experiences in order to inform education and industry strategies around recruiting Māori.

The team is also collaborating with employers to offer industry work experience and mentoring to students. "We've had some positive responses," Kym says. "The team is now working on finding time to convert those to opportunities for students."

Graduate capability workshops for engineering employers and educators

Relationships between educators and employers are crucial to ensuring engineering graduates are well-prepared for employment. The graduate development project aims to support engineering educators to review their engagement with employers to improve the quality of learning and teaching in NZDE and the BEngTech programmes.

Three workshops for engineering employers and educators will be held this month. The workshops will review a draft good practice guide which focuses on the strengths of engineering education at ITPs, and helps to inform priorities for change.If you are an employer or educator involved in innovative practice you are invited to one of the following workshops:

Auckland: 19 September 2018, 10am-12 noon

Christchurch: 26 September 2018, 3-5pm

Wellington: 27 September 2018, 10am-12 noon.

To find out more and to register for a workshop, email project manager Brendon Mischewski, **brenden@mischewski.co.nz**

Micro-credentials feasibility studies complete. Next step: the pilots

An update on Engineering e2e's micro-credentials work by project manager Brenden Mischewski.

Engineering e2e funded eight micro-credentials feasibility studies this year.

These feasibility studies were intended to shape the implementation of micro-credentials in New Zealand and promote more responsive and innovative engineering education.

Each study looked at the feasibility of offering micro-credentials for distinct parts of the engineering education pipeline. These include the secondary-tertiary transition, preparing people in employment for advanced study, delivery arrangements for the NZDE, catering for specific industry needs, arrangements for recognition of prior learning, and professional development.

The feasibility studies were led by Downer, Manukau Institute of Technology, the Electricity Engineers Association, Otago Polytechnic, The Skills Organisation, Unitec Institute of Technology and UtilityNZ.

The results of the feasibility studies indicate strong stakeholder interest in the concept of micro-credentials, and suggest considerable diversity in approach and design.

Micro-credentials offer the potential for a more flexible engineering education pipeline, a more diverse student population with increased numbers of people in employment, women, Māori and Pasifika, and clearer signals for employers about the attributes of students and graduates, particularly in the relation to the graduate outcomes sought through the NZDE and BEngTech.

Study results show that micro-credentials have the potential to contribute to engineering education at a variety of levels and a case has been made for piloting these approaches.

Five proposals for micro-credentials pilots are expected and funding decisions will be made over the next two months.

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