

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

A well steered course to a brighter engineering future

The Engineering e2e Steering Group's formal role ended this past month and, as chair, I take this opportunity to thank them, and to share our thoughts and recommendations with you.



The volunteer engineers and educators who made up the Steering Group met regularly over the past four years. They have considered a range of initiatives and made their recommendations to the Tertiary Education Commission (TEC) on behalf of the sector. Members gave their time and expertise freely to

help address New Zealand's critical shortage of engineers and I thank them warmly for their efforts, it was a pleasure to work with them.

Our approach has been to collaborate, commission and communicate to find ways to draw more students into tertiary study in engineering. Our partners in this work have been engineering employers, professional organisations and educators, all of whom are critical to the engineering education and training system.

We recommend that the connections established with employers and educators be maintained, indeed grown. The variety and success of the Engineering e2e programme provides strong evidence of the positive role employers play in workforce development. We also recommend oversight and support to ensure the success of ongoing Engineering e2e initiatives. It will be important to continue encouraging feedback and participation by sharing the outcomes of this work with engineering employers and educators through Engineering e2e's publications.

I've enjoyed my role as Steering Group Chair, it has been a tremendous opportunity to make a difference for the engineering sector. The skills shortage problems we face are not easy ones to solve, particularly as they relate to institutes of technology and polytechnics (ITPs), which suffer declining enrolments and perception problems. The Engineering e2e team at TEC has provided excellent support to the Steering Group, they have a professional and hard-working approach. Their expertise and commitment has contributed significantly to Engineering e2e's success.

While the Steering Group's formal role has come to an end, this doesn't mean that Engineering e2e is over – far from it! The Steering Group has set in motion a comprehensive programme which TEC will manage through to completion over the coming 18-20 months.

Wishing you all a relaxing and very happy holiday season.

Sir Neville Jordan

ENGINEERING E2E STEERING GROUP RECOMMENDATIONS TO TEC

1. Industry involvement is crucial to successful innovation in engineering education. The Steering Group strongly recommends that the connections established between employers and educators be maintained, indeed grown. The variety and success of the Engineering e2e programme provides strong evidence of the positive role employers play in workforce development. Engineering e2e funding has been allocated and significant work is now underway. This funding has allowed providers to free up resources to respond directly to labour market needs.
2. Oversight and support is recommended to ensure the success of ongoing Engineering e2e initiatives, including:
 - The existing 21 contracts.
 - Our commitment to consider proposals from Secondary-Tertiary Pathways Project (STPP) institutions.
 - Work with Tristan Denley of the University System of Georgia on a co-requisite maths approach.
 - Phase 3 of the degree apprenticeship.
 - A potential pilot of a regional engineering education hub.
3. It is important to continue encouraging feedback and participation by sharing the outcomes of this work with engineering employers and educators through Engineering e2e's publications.
4. Our discussions with small-to-medium engineering firms show that many are unaware of the value of hiring New Zealand Diploma in Engineering (NZDE) or Bachelor of Engineering Technology (BEngTech) graduates. We believe there is a great need to continue educating employers about the differences between the three main engineering qualifications.
5. Evaluation of the completed initiatives tells us that, as a designated integrator, Engineering e2e has an important role to play in supporting the education-to-employment system. Further evaluation of Engineering e2e would be useful to determine its long-term effectiveness and inform TEC's ongoing e2e activity in engineering and other disciplines, such as the primary industries and construction.

SIX KEY INITIATIVES – PROGRESS UPDATE

REGIONAL HUBS

Over the past few months, the Canterbury Engineering Hub Group has been mapping engineering education ecosystems – from pre-apprenticeship through to PhD – and plans to submit a feasibility study in late January 2019. They are also looking at collaborating with Tūranga (Christchurch central library) to provide interesting and engaging technical programmes to the general public using the library's dedicated creative spaces.

DIVERSE ENGINEERING WORKFORCE

We are funding Ngāi Tahu to deliver the He Toki Iwi Industry Māori Engineering Workforce Partnership project, aimed at more than doubling the number of Māori NZDE and BEngTech graduates at Ara and Otago Polytechnic by 2021. In a similar initiative, Waikato Tainui are working to double the number of Māori engineering graduates at Wintec and MIT by 2021

SECONDARY-TERTIARY PATHWAYS PROJECT

Successful initiatives trialled by the six tertiary institutions include courses in which students can gain engineering skills/knowledge, work towards NCEA credits, and/or complete the NZDE Engineering Fundamentals paper. The institutions hope to continue some of their programmes after February, when the STPP project concludes.

DEGREE APPRENTICESHIP

The pilot Bachelor of Engineering Technology degree apprenticeship in Asset Management is set to go next year, with some employers already employing apprentices in anticipation of enrolling them in the programme. Last month, WelTec, Otago Polytechnic and the Institute of Public Works Engineers Australasia NZ Division (IPWEA NZ) signed a memorandum of understanding for delivery of the pilot.

MICRO-CREDENTIALS

We funded eight micro-credentials feasibility studies this year and accepted five proposals for pilot funding. These were developed by Unitec, IPWEA, Otago Polytechnic, MIT and the Electricity Engineers' Association, and will be offered in 2019.

GRADUATE CAPABILITIES

Engineering employers and educators have been enthusiastic about collaborating on the Making Education More Relevant project. It aims to produce work-ready graduates and raise the visibility of the NZDE and BEngTech. Tertiary providers are looking to implement changes in their programmes from 2019 onwards.

ENGINEERING E2E MILESTONES 2014-18

2014

- Project begins in July
- First Engineering e2e Steering Group meeting – extensive consultation begins with stakeholders
- engineeringe2e.org.nz is launched
- [Monthly newsletters](#) begin
- [Engineering Barriers and Responses](#)
- NEEP Reference Group meeting
- Alternative Engineering Pathways Professional Forum

2015

- [Improving Pathways to Engineering Technology Education](#)
- Strategic update #1 for Minister: [Engineering Change](#)
- Pathways pilot begins
- Talking with Employers Workshop and [Report](#)
- First of our regularly updated [Work Plans](#)
- [Stepping into One Another's World](#)
- [Creating Engineers – Climbing the Educational Staircase](#)
- Strategic update #2 for Minister: [Engineering Our Future](#)

2016

- [Make the World](#) awareness campaign launches in May
- Government allocates extra funding
- Secondary-Tertiary Pathways Project pilot begins
- [Making Tertiary Study in Engineering More Relevant](#)
- [UK Degree Apprenticeships: A Year in Review](#)

2017

- Resource Portal scoping complete
- Research on sponsored degrees continues
- Degree standard written
- [Engineering Education Hubs](#) research complete
- Project to raise employer awareness of NZDE, NZDEP (New Zealand Diploma in Engineering Practice) and BEngTech
- Engineering micro-credentials pilot procurement underway
- Eight micro-credential feasibility studies funded
- [Micro-credentials: A model for engineering education?](#)
- [A Pilot Study of the Application of Degree Apprenticeships in New Zealand](#)
- A series of [Info Sheets](#) published

2018

- www.ree.org.nz launched
- Hackathon held for Wellington High School and ICT Graduate School students
- He Toki Iwi Industry Māori Engineering Workforce Partnership funded
- Prof Julia Clarke, Manchester Metropolitan University, visited to discuss degree apprenticeships
- NZCER's [Engineering e2e: An evaluation](#) finds Engineering e2e's approach useful
- Degree apprenticeship programme phase 2 underway
- Engineering Education Regional Hub feasibility study funded
- Five micro-credentials pilots funded
- Exploration of a co-requisite maths programme begun
- Enhancing Graduate Capability project underway
- Waikato-Tainui Engineering Workforce Partnership established
- Website upgraded and 50 newsletters published