

IN THIS ISSUE ... *we look at the landmark Engineering E2E Talking with Employers workshop held in Wellington in early June.*

IN OUR JUNE NEWSLETTER we detailed a raft of engineering promotional initiatives funded under budget 2015, including:

- \$5.2 million for 50 more equivalent full-time students (EFTS) in engineering at tertiary institutions in 2016, which will increase to an additional 300 EFTS by 2019
- a public awareness campaign in 2016-17 to raise interest in engineering and the broad range of study options available, particularly at ITPs
- workforce challenge grants to encourage innovative ideas to support student success and transitions to work
- secondary-tertiary pathways programmes to support schools and TEOs to work together to deliver secondary-level programmes to prepare and pathway students into tertiary engineering study.

With so much work in the pipeline, TEC sees value in continuing to seek the guidance of the Engineering E2E Steering Group to oversee this and ongoing Engineering E2E activities. The Steering Group and Programme Manager have agreed to continue their work until the end of 2015, and roles and responsibilities will be reshaped to fit with this new, more operational phase of the programme. In next month's issue we'll feature our work plan for 2015-2016.

Earlier this year, TEC contracted Massey University's Associate Professor Jane Goodyer and Dr Greg Frater to provide advice on the viability of apprenticeship models to educate degree level engineering technologists.

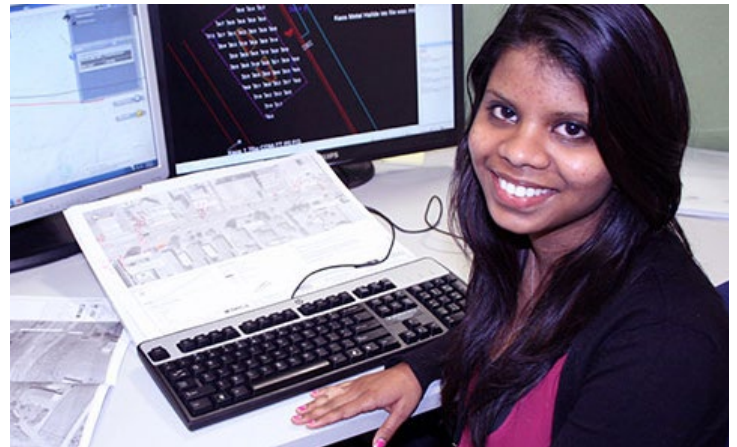
They conducted a literature review of learning models that have high levels of employer involvement, supplemented by interviews with tertiary providers involved in delivering new degree apprenticeships. Two key findings from their research are "the need for effective collaboration between employers and educationalists at the design and planning stage, and clear pathways to higher levels of education. Employers have to be in the driving seat, specifying degree standards that are outcome-based and occupation-driven."

Professor Goodyer and Dr Frater endorsed apprenticeships as a viable model for educating engineering technologists and have provided recommendations for establishing new degrees based on an apprenticeship learning model. Their report will be on our website in July.

As always, we're interested in your feedback – contact us at engineeringe2e@tec.govt.nz

SIR NEVILLE JORDAN

Chair, Engineering E2E Steering Group



Engineering E2E Talking with Employers

The Engineering E2E Talking with Employers workshop, held on 9 June in Wellington, brought together industry leaders to discuss the skills and capabilities required by engineering graduates as they enter the workforce.

The Professional and Graduate Capability Framework

The workshop used the Professional and Graduate Capability Framework, which was developed by Geoff Scott, Emeritus Professor of Higher Education and Sustainability, University of Western Sydney. This framework is used to identify, validate and cluster the programme-level learning outcomes in individual degrees and diplomas.

The Framework uses extensive peer review and input from a wide range of university and external reference points, and has been validated in studies of successful graduates in nine professions, and studies of educational leaders in schools, VET and higher education.

Thirty chief executives and senior managers from a wide range of engineering disciplines, including those involved with tertiary industry advisory groups, attended the workshop, with representatives of engineering education providers and IPENZ as observers. The aim was to use Professor Scott's Framework to determine the industry's current and future engineering needs to better understand its awareness of engineering qualifications, and to test the usefulness of the Framework in doing so.

The workshop

In the next 15 years, the system will need to foster inventiveness in graduates to allow them to grapple with new and emerging forms of technology, said Geoff Scott in

his presentation. He talked of the need for 'work-ready plus' graduates – graduates with strong foundational skills in engineering, but also the interpersonal capabilities to thrive when confronted with complex problems in the workplace.

Geoff believes there needs to be a systematic way to get employer leverage to get buy-in to produce the graduates capable of meeting the future technological and engineering challenges of tomorrow. Consideration needs to be given to how we support and leverage education-employer partnerships, and on the fitness for purpose of current assessment, resources and teaching practice.

Geoff's work over the past decade looked at high-achieving graduates three to five years out of university to determine what makes them successful. The Framework is the key outcome of this research, and has been used to help improve teaching and learning at tertiary level in Australia.

Participants were asked to consider the Framework and rank their top three capabilities. 'Commitment' and 'energy and passion' ranked highly for all participants; 'ability to get along with people from all walks of life' and 'self-awareness' including 'learning from experience' and an ability to 'diagnose what didn't work' were in most participants' top three.

Key feedback from participants:

- ITP students are generally more work-ready than university graduates.
- Different levels of competence are required of graduates depending on their job role and discipline, and these may not necessarily be gained through education providers, but within an employment context through in-house, on-the-job training and experience, and professional development.
- Industry needs engineering technicians as well as enterprise growth enablers – they have a different and complementary role within teams.
- There is a need to raise awareness of the opportunities offered by a career in engineering to encourage greater uptake of engineering study at ITPs and universities.
- ITPs and universities need to work together to ensure their offerings complement each other and promote their differences.
- There is a need to foster more streamlined pathways from education to employment, and a need to up-skill graduates already in the workforce and enable them to pursue study opportunities at ITP/university level.
- There is a need for more dilemma-based assessment in the curriculum, along with the need to create more 'real-life' problem-solving opportunities at tertiary-level.
- There is a need for tertiary institutions offering engineering qualifications to strengthen linkages with overseas organisations, to share knowledge, resources and best practice.



FEATURED CASE STUDY

INDUSTRY INVOLVEMENT IN NZDE COURSE

Nelson Marlborough Institute of Technology has actively engaged with local employers while delivering the NZ Diploma in Engineering (NZDE) Civil programme. For Paul Duffy, a member of the Cadet Steering Group at Downer, this provided an opportunity to contribute to the programme and also trial a different method of delivering academic learning for his cadets.

engineeringe2e.org.nz/Employers/Case_study.cfm?ID=28



Feedback on the Framework

Many participants said that they found the Framework a very useful articulation of the skills they are looking for in engineers. Some said they would integrate the Framework into their recruitment processes when assessing the competencies and capabilities of graduates seeking employment. Participants made some suggestions for changes to the Framework to make the wording more specific, and a number raised the need for cultural competency to be embedded in the Framework.

Follow-up and recommendations

Participants expressed a willingness to keep in contact to work on joint initiatives, especially in raising awareness of the opportunities for students when pursuing engineering as a career, and a strong campaign to foster a pipeline of more women, Māori and Pasifika into engineering careers.

Five recommendations came through strongly for consideration by the Engineering E2E Steering Group:

- Change the curriculum to incorporate the Framework, the opportunity for experience across engineering disciplines, and entrepreneurial experience.
- Improve stair-casing opportunities for students, potential students and those in employment.
- That an engineering graduate study based on the Framework be replicated in the New Zealand context.
- Follow-up with participants on ideas for contributions to a public awareness campaign.
- Form a reference group to act as a conduit for ongoing advice and guidance from workshop participants.

Find out more...

See **Creating Work-ready-plus Graduates**, a case study that discusses in further detail the Engineering E2E Talking with Employers workshop, its content and its outcomes: engineeringe2e.org.nz/Employers/Case_study.cfm?ID=30

IF YOU HAVE ANY ENQUIRIES, PLEASE CONTACT US: ENGINEERING E2E PROGRAMME TEAM

Tertiary Education Commission Te Amorangi Mātauranga Matua
Phone 04 462 5256 Email engineeringe2e@tec.govt.nz
www.engineeringe2e.org.nz