ENGINEERING
EDUCATION TO EMPLOYMENT

THE ENGINEERING E2E (EDUCATION TO EMPLOYMENT) PROJECT IS A RESPONSE TO THE NEW ZEALAND GOVERNMENT GOAL OF INCREASING ENGINEERING GRADUATES TO 500+ PER ANNUM

Work Plan September 2017 (page 1/2)

EDUCATIONAL DELIVERY

EMPLOYER ENGAGEMENT

CURRENT INITIATIVES	LEAD	PROGRESS TO DATE	2017 SEP – 2018 JUL »	INDICATORS OF SUCCESS
SECONDARY-TERTIARY PATHWAYS PROJECT Engineering e2e is funding projects from secondary schools and tertiary education organisations (TEOs) to work collaboratively to deliver programmes that successfully prepare and pathway students – particularly women, Māori, and Pasifika – into tertiary engineering study. Successful projects will also increase awareness of engineering as a career in the community, and increase enrolments in Level 6–7 engineering qualifications.	ITPs Secondary Schools	• Pilot completed (2015) • Application process for funding set up (Mar 2016) • Project promoted to ITPs and schools (Apr 2016) • Application/selection process set up and implemented (Jul 2016) • Six projects selected and funded (Sep 2016) • Project planning meetings held for the funded projects (Nov 2016) • First project reports received (Apr 2017)	SECONDARY-TERTIARY PATHWAYS PROJECT IMPLEMENTATION *Government grant funding until June 2019* Project support throughout 2017: • Ongoing evaluation • Support implementation • Promote project outcomes	• Transparent and demonstrably successful secondary-tertiary pathways are in place. • A quantifiable marked increase in collaboration between ITPs and secondary schools. • Increasing enrolments in NZDE & BEngTech.
SPONSORED DEGREES Exploration/development of models of delivery (particularly relevant for rapidly changing, high-tech industries) which allow both on-the-job training and completion of a Level 7 qualification in engineering.	ITPs Employers	• Scoping report commissioned (Jane Goodyer) and delivered (Jun 2015) • Minister agrees on funding for a pilot 'degree apprenticeship' programme (2015) • ITPs and Employers consulted (2015) • Research: *Stepping into One Another's World* (Jul 2015) • Initial discussions with potential pilot partners held (Nov 2015) • Research: *UK Degree Apprenticeships: A Year in Review* (Nov 2016) • Research: *A Pilot Study of the Application of Degree Apprenticeships in New Zealand* (Jun 2017)	SET UP PILOTS BASED ON RESEARCH OUTCOMES AND EMPLOYER CONSULTATION *Workforce Challenge Grant funding until June 2020* • Research to determine employer needs • Set up pilot	• There is a substantial increase in numbers of employers participating in apprenticeships. • A high proportion of course completions from pilot programmes
ENGINEERING EDUCATION HUBS Engineering e2e is consulting employers and educators to develop a vision and direction for engineering education hubs. Engineering hubs would be regionally-based centres for engineering education which involve employers, high schools, universities, ITPs and ITOs.	Massey University	• A literature review of education hub models, including those currently running in Ireland and Austria (May 2017)	IMPLEMENTATION • Investigate a process of engagement with stakeholders to develop a vision and direction for engineering education hubs • An outcome of this work will be a set of factors that should be considered when establishing a hub. We want tertiary institutions to be able to operationalise a hub as they see fit but with a clear understanding of what they should achieve	• Regionally-based centres for engineering education are in place, involving employers, high schools, universities, ITPs and ITOs. • Secondary-tertiary pathways projects, cadetships, scholarships and work experience are run through the hub. • New initiatives, including co-created and taught curriculum and degree apprenticeships, are implemented – and initiatives that raise awareness of engineering are supported. • Surveys of students and employers report satisfaction with the quality of education. • Popular and effective pathways into engineering are established and a single entry point for engineering qualifications is available. Students make good decisions about their courses of study and are able to staircase between qualifications. • Learning environments meet the needs of a diverse (and growing) student body, reflected in an increase in tertiary enrolments in engineering subjects • Models of work-integrated learning, new teaching modalities and research-led good teaching practice in engineering education is in place, with widespread collaboration and sharing of information and best practice between all providers.
MICRO-CREDENTIALS Micro-credentials are emerging as an important part of the mix of alternative credentials. These are packages of learning designed to meet specific learner needs that are smaller than a conventional qualification. Implemented well, micro-credentials would provide students and employers with better information, support the mixing and matching of courses, give TEOs more flexibility, and encourage innovation.	Mischewski Consulting Engineering e2e	• *Micro-credentialing: A model for engineering education?* – a report from Mischewski Consulting that explores how micro-credentials might be used to improve the uptake of engineering education, particularly of the New Zealand Diploma in Engineering (NZDE) (May 2017)	IMPLEMENTATION • Provide support to sector consortia to develop and deliver micro-credentials pilot(s) based on that outlined in the final report • Engage with Government agencies to ensure that investment and regulatory settings support the delivery of the pilot(s) • Develop a service specification to guide the selection of consortia and the foci of pilot delivery • Direct source procurement for pilot(s), including advice to consortia and validation of their proposed approaches against the model	• A range of pilots delivered.
GROWING THE PIPELINE OF WORK-READY ENGINEERS In 2014, Engineering e2e ran a workshop that introduced industry leaders to the Graduate Capability Framework developed by Australian academic Emeritus Professor Geoff Scott. Participants explored how the framework could help determine perspectives on graduate profiles and future skill needs. This workshop led to further New Zealand-based research and, lately, a proposal to facilitate collaboration between industry and educators to improve the relevance of engineering education.	ITPs	• Alternative Engineering Pathways Professional Forum held (Nov 2014) • Research: *Improving Pathways to Engineering Technology Education* (Dec 2014) • Regional workshop undertaken • Case study outcomes published on Engineering e2e website • NEEP Reference Group reconvened and skills needs confirmed (Nov 2014) • Employer-engagement workshop held (Jun 2015) • A pilot workshop on Geoff Scott's Graduate Capability Framework, exploring its use in determining graduate profiles and future skill needs; workshop participants consulted on ideas for a public awareness campaign (Jun/Jul 2015) • Otago Polytechnic contracted to do an engineering graduate study based on the framework in the New Zealand context (Jul 2015) • A reference group formed to act as a conduit for ongoing advice and guidance from workshop participants (Jul 2015) • *Talking with Employers Workshop Report* published (Aug 2015) • Research: *Supporting Excellent Teaching & Learning in Engineering Education* (Mar 2016) • Research: *Creating Engineers – Climbing the Educational Staircase*, a report into the benefits of staircasing (Mar 2016) • Research: *Making Tertiary Studies in Engineering more relevant (Nov 2016)*	IMPLEMENTATION • A set of work-ready capabilities that employers would like to see in NZDE and BEngTech graduates. Alignment of these capabilities with international agreements for engineering education, the Sydney and Dublin Accords. • Effective practice and assessment that satisfies accreditation requirements. • A sustainable employer engagement process. • Teaching practice that ensures 'work ready plus' outcomes for learners and employers which may include problem based learning, experiential learning, practicums, construction projects, work with industry, internships, futures projects. • Enhanced collaboration between engineering education providers; • Criteria to appoint high quality engineering staff to ITP institutions throughout New Zealand.	• Surveys of employers indicate good engagement. • Sustainable collaboration between industry and institutions providing NZDE and BEngTech programmes to ensure best practice for graduate engineers. • ITP employment outcome surveys indicate students are being employed before or soon after graduation.

INITIATIVES UNDERTAKEN THROUGH THE ENGINEERING E2E PROGRAMME CONTRIBUTE DIRECTLY TO THE ACHIEVEMENT OF THE GOVERNMENT'S BUSINESS GROWTH AGENDA PRIORITY OF BUILDING A MORE PRODUCTIVE AND COMPETITIVE ECONOMY

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	CURRENT INITIATIVES	LEAD	PROGRESS TO DATE	2017 SEP–DEC / 2018 JAN–JUL »	INDICATORS OF SUCCESS
EMPLOYER ENGAGEMENT (continued)	**COMMUNICATIONS TO EMPLOYERS** The development and implementation of a communications plan that raises awareness of the value of NZ Diploma in Engineering (NZDE), NZ Diploma in Engineering Practice (NZDEP) and BEngTech graduates amongst small to medium engineering firms – particularly those in regional locations.	Scotts Communications Engineering e2e	• Work commissioned and consultation on definitions begun (May 2017) • Plain English definitions of the roles able to be carried out by NZDE, NZDEP and BEngTech graduates agreed upon and published • Case studies of graduates and employers published • Research on employers' attitudes and needs commissioned • Draft communications and engagement plan prepared	IMPLEMENTATION • Use champions to educate and influence • Use industry channels to maximise contact • Research to inform and measure progress • Develop collateral to deliver the message	• Small- to medium-sized engineering firms recruit more NZDE and BEngTech graduates.
	RESOURCE PORTAL A resource portal that gives engineering employers a single access point for the latest tools to recruit, retain and grow employees, with an emphasis on supporting the development of a diverse engineering workforce. The portal would also link employers to examples of good practice and provide a form of 'how to' guide and examples of what others have done.	Ocular Scotts Communications Engineering e2e	• Working group formed, including key industry partners and representation from the Engineering e2e Steering Group, to assist in developing a set of stories about how people could use the portal developed, written from the perspective of different users (May 2017) • Portals from around the world that demonstrate good practice identified and used to visualise the types of portals that can be achieved (May 2017) • Design brief and timeline created for the development of portal (May 2017)	IMPLEMENTATION • Build and promote a resource portal	• A user-friendly portal with good visitor numbers. • Feedback indicates that employers find the content valuable.
	GROWTH THROUGH DIVERSITY Proposed preliminary research on how to boost the numbers of women, Māori, Pasifika and other groups in the engineering workforce, with input from other stakeholders, including MoE, NZQA, TPK, MBIE, MPIA and industry.	Engineering e2e	• A survey of enrolment demographics completed • A stocktake of STEM engagement initiatives completed	IMPLEMENTATION • Undertake research and consider recommendations • Consider the potential of a resource for engineering employers • Consult with iwi groups • Ensure all Engineering e2e initiatives reflect the need for greater diversity in the engineering workforce	• Increased numbers of Māori, Pasifika and women in engineering study.
	SUPPORT FOR IPWEA NZ'S 'FOSTERING OUR FUTURE' 'Fostering our Future' is an IPWEA NZ initiative to proactively manage the future capability and capacity of the public works engineering profession in New Zealand. It responds to the significant challenges faced by public works organisations to attract and retain the people they need.	IPWEA NZ		IMPLEMENTATION • An assessment will be made of the commercial viability, affordability and deliverability of each project • Agreement on the preferred way forward • Commercial, financial and management cases • Draft report for review • Finalise programme business case for approval to proceed to next stage • Final project report	• The project delivers a mix of projects that achieve a more skilled, resilient, and innovative workforce and a profession that is more attractive and is a career of choice for young people.
PROMOTION	**PUBLIC AWARENESS CAMPAIGN** Raise interest in engineering and the broad range of study options available; key messages are around individual achievements of a diverse range of people.	Employers ITPs OPEN Communications	• Research: *Engineering Barriers and Responses*, a report on barriers to the uptake of engineering study published (Oct 2014) • *Make the World*, Engineering e2e's major public awareness campaign, launched (May 2016, ongoing) • Wave One evaluation complete and available • Wave Two evaluation complete and available • Survey of enrolling students on what influenced their decision to study engineering (2017)	PROGRAMME OF ONGOING INITIATIVES *Government grant funding until June 2017* • Make the World public awareness campaign continues: • Continued rollout of media schedule (OPEN Communications)	• Improved public awareness of engineering and the education pathways to the engineering profession.
	ENGINEERING E2E WEBSITE AND COMMUNICATIONS	Engineering e2e	• Regional launches held (Jul-Aug 2014) • Two infographics published: *Make the World* and *Leaky Pipeline* (Jan 2015) • Participation in the Metro BEngTech and NZDE Forum (Feb 2015) • Two strategic reports published: *Engineering Change* (Mar 2015); and *Engineering Our Future* (Nov 2015) • *Good Practice Case Studies* published (ongoing) • *Engineering e2e Work Plan* (this document) published (2014 and ongoing regular updates) • Discoveries section added to the website • Monthly newsletter and other regular communications • Current publications reviewed and updated • Series of infosheets published (Apr 2017) • Communications plan for 2017 developed	IMPLEMENTATION • Ongoing promotional activity • Continue to publish case studies, newsletter and regular communications	• Stakeholders demonstrate familiarity with Engineering e2e initiatives.
GUIDANCE	**ENGINEERING E2E PROGRAMME MANAGEMENT** Consult with stakeholders and oversee the development and implementation of Engineering e2e initiatives.	TEC	• Successful completion of agreed initiatives	ONGOING OVERSIGHT OF ENGINEERING E2E INITIATIVES • Ongoing consultation with stakeholders throughout the development and implementation process • Formation of MoUs with stakeholders to support collaboration	• Stakeholder satisfaction with the nature, development and implementation of Engineering e2e initiatives.
	ENGINEERING E2E STEERING GROUP	TEC	• Successful completion of agreed initiatives • TOR & MO reconsidered and updated	ONGOING GOVERNANCE, PROVIDING ADVICE/GUIDANCE	• Engineering e2e goals achieved and an increasing number and diversity of students are graduating with engineering qualifications, particularly at Levels 6- 7.
	ENGINEERING E2E EVALUATION Evaluation runs from October to December 2017.	NZCER		IMPLEMENTATION • Draft working theory agreed with the Engineering e2e Steering Group and TEC to form the basis for selecting and considering evidence • NZCER will systematically categorise Engineering e2e 's existing documentation in light of its significance in the Engineering e2e model • A plain English report for Engineering e2e's stakeholders across industry and education sub-sectors, and policy analysts and managers in different agencies	The evaluation provides a clear picture of: • The effectiveness of the approach Engineering e2e takes to systems integration; and • What can be learned that might apply to Engineering e2e in the future and/or to e2e projects in fields other than engineering.

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