



Parliament of Victoria  
Legislative Assembly, Economy and Infrastructure Committee  
Parliament House, Spring Street  
EAST MELBOURNE VIC 3002  
Via email: [Unskillsinvestment@parliament.vic.gov.au](mailto:Unskillsinvestment@parliament.vic.gov.au)

13 May 2022

## RE: INQUIRY INTO VICTORIAN UNIVERSITIES' INVESTMENT IN SKILLS

Engineers Australia appreciates the opportunity to provide feedback to the Victorian Legislative Assembly Economy and Infrastructure Committee's Inquiry into Victorian universities' investment in skills. This submission provides four focus points to support the development of engineers with the skills of the future:

- Promoting and building awareness of engineering.
- Leadership in mentoring and practical experiences for engineering students.
- Collaborate with industry to expand educational opportunities, focusing on niche or emerging areas.
- Development of micro-credentials.

This feedback is informed by ongoing work, including a discussion paper released by Engineers Australia, which provides a broad view of the situation Australia is facing now and into the future (attached).

Engineers Australia is the peak body for the engineering profession in Australia. We are a professional association with over 110,000 individual members, constituted by Royal Charter, to advance the science and practice of engineering for the benefit of the community. As Australia's signatory to the [International Engineering Alliance](#) (IEA), Engineers Australia maintains national professional standards that are benchmarked against international norms. This includes accreditation of university engineering programs.

Despite the challenges faced by the Victorian economy during the pandemic, the state possesses strong and diverse economic opportunities. Advances in technology, the transition to clean energy, advanced manufacturing, construction, and infrastructure investment are just some of the areas that will create jobs and require new skills in engineering. Nationally, the National Skills Commission predicts science, technology, engineering, and mathematics (STEM) occupations will grow by 12.9 per cent over the next five years. With Victoria being the second largest employing state, and three of Victoria's top eight employing industries requiring engineering skills, ensuring universities educate more engineers with the needed balance of skills is in the State's best interest.<sup>1</sup>

Increasingly, there is recognition that engineers utilise skills beyond their specific technical expertise. Engineers work in complex multidisciplinary teams, need to be digitally savvy, communicate effectively and efficiently, maintain higher-order interpersonal skills and apply systems thinking. Engineers frequently need to develop the social licence for a project, apply principles of sustainability to all their work, practice ethically and engage directly with a broad range of stakeholders. Accordingly, there is a need for universities and industry to work together to ensure the skills of tomorrow are available, both from new graduates and through upskilling of the existing workforce.

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<sup>1</sup> 'Australian Jobs 2021: Victoria' Australian Government *National Skills Commission* (accessed 6 May 2022)  
<https://beta.skillscommission.gov.au/reports/australian-jobs-2021/jobs-location/victoria>



### **Promoting and building awareness of engineering**

The development of an engineer begins early in their education. Building awareness of the future skills required, and corresponding career opportunities, needs to be a focus for universities. Research shows targeting students at high school, with a focus on communicating what engineering is and the impactful nature of profession, and supporting the uptake of STEM subjects, will contribute to developing a larger pool of students with the prerequisites and interest to study engineering at university. Universities and high schools should work together to promote the engineering profession and corresponding opportunities. An example of this would be to partner and showcase the application of engineering principles in mathematics and science classes.

### **Leadership in mentoring and practical experiences**

Engagement with industry and professional practice whilst at university helps develop professional skills, attitudes and attributes.<sup>2</sup> Through exposure to industry our future workforce becomes industry aware, productive and dynamic and innovative thinkers. It also gives students the opportunity to appreciate the needs of industry and the skills of greatest value. To be successful, industry engagement is required. The Victorian Government has an opportunity to support universities by demonstrating leadership in this area through offering mentoring, work integrated learning, and internship opportunities within Government departments and funded projects.

While important for all students, mentoring has the additional benefit of helping to develop more gender diversity in the profession. Only 13 per cent of qualified engineers in Australia are female.<sup>3</sup> To help promote ongoing participation of female engineering students, there should be a focus on pairing female students with female engineers working in their field.

### **Collaboration with industry**

The University sector in Victoria should be encouraged and supported to collaborate with industry in understanding gaps in the workforce and work to develop the skills needed. Engineers Australia supports the work of the Australian Council of Engineers Deans and their recommendations for change in the sector<sup>4</sup>.

Through accreditation activities, Engineers Australia has seen innovative course structures, including industry-run university electives, which provide an opportunity for industry to be an important part of the education process, developing skills in niche or emerging areas otherwise not covered in traditional curriculum. Celebrating, sharing, and extending best practice across Victorian universities should be supported by the Victorian Government. Industry led or inspired coursework has many benefits including,

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<sup>2</sup> 'Opportunity to influence future of student professional practice' *Engineers Australia* (accessed 13 May 2022)  
<https://www.engineersaustralia.org.au/news/2022/03/opportunity-influence-future-student-professional-practice>

<sup>3</sup> Kaspura, A, 'The Engineering Profession: a statistical overview' Fourteenth Edition, *Engineers Australia* June 2019  
<<https://engineersaustralia.org.au/Government-And-Policy/Statistics>>

<sup>4</sup> 'Engineering change: the future of engineering education in Australia' *ACED* (accessed 10 May 2022)  
<<https://aced.edu.au/downloads/2021%20Engineering%20Change%20-%20The%20future%20of%20engineering%20education%20in%20Australia.pdf>>



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industry being able to identify talent and students accelerating their understanding of industry while still in the classroom. Engineers Australia recommends the Victorian Government consider the engineering skills needed to achieve their priorities, and then work with the University sector and industry to direct investment in delivering elective courses in niche or emerging areas identified as having a shortage, or that may experience rapid development.

### **Micro-credentials**

The pace of change and the development of technology in many sectors presents challenges for traditional university course content and laboratories to remain relevant. Micro-credentials are a critical way to complement the development of skills needed for rapidly developing technologies and emerging disciplines. For a micro-credential to be effective, there must be a focus on learning outcomes, culminating in an assessment. Unlike traditional post-graduate studies however, the time and content are reduced and focuses on a specific area of development. Micro-credentials are beneficial for experienced engineers who need to upskill in new areas within their sector, or for those looking to make a career change but remain in the profession. For micro-credentials to be valued, they need to be designed in collaboration with industry, ensuring the learning outcomes are valued by employers and achieve the intended results.

Engineers Australia is piloting a Program Endorsement Framework to support recognition of micro-credentials, providing confidence to participants and industry that the learning outcomes and structure have been independently evaluated. To improve efficiencies and reduce costs, Universities should look at partnering with other registered training organisations, particularly those with an engineering focus, to design, promote and deliver these courses.

Engineers Australia welcomes the opportunity to engage further with the Legislative Assembly, Economy and Infrastructure Committee on this matter. You can reach me at [aprintz@engineersaustralia.org.au](mailto:aprintz@engineersaustralia.org.au) or on (03) 9321 1762.

Yours sincerely,

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