Australian Catholic University

Submission to the University Research Commercialisation Scheme Taskforce

University Research Commercialisation: Consultation Paper

April 2021

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Executive Summary

Australian Catholic University (ACU) appreciates the opportunity to provide feedback on the *University Research Commercialisation* consultation paper (the Consultation Paper).

ACU welcomes the consultation as part of the Government's efforts to improve the practical effectiveness of university research in Australia. ACU broadly supports the proposals contained in the Consultation Paper, with some qualifications to ensure an appropriate scope for any new scheme (Scheme).

The Education Minister has articulated the Government's objectives as follows:

> *We want our high-quality research to better translate into the breakthrough products, new businesses and ideas we need to grow our economy and improve our society.*[1]

To achieve these outcomes it is crucial that research "commercialisation" and "translation" is defined broadly in the Scheme to encompass research that has "real-world" benefits generally.

To this end, the definition of university-industry collaborations should include valuable community partnerships, such as with health or education partners. These research collaborations, while not necessarily resulting in new products or businesses, often generate ideas and new processes that improve productivity, create service delivery efficiencies and save government and industry money.

Such advancements can improve health or education outcomes, with significant long-term economic and social benefits. Indeed, they can help to address some of the "big societal challenges" identified by the Education Minister in his recent speech at The University of Melbourne, such as the decline in Australian school students' performance in international assessments.

More broadly, ACU agrees with other universities that any Scheme should not discourage or devalue basic research. Research publications and citations remain important, especially in the international context where they are an accepted measure of research quality and excellence.

If Australia wants to attract international investment in Australian research and start-ups, universities must sustain their efforts in these areas, noting that government continues to drive the Excellence in Research for Australia (ERA) framework to promote research quality. The success of national efforts such as the Global Talent Program to attract high calibre international talent relies on international researchers being encouraged to continue to achieve globally-valued metrics while in Australia.

In response to the issues raised in the Consultation Paper, ACU recommends the Scheme should:

- support universities to adapt research translation practices adopted by commercial research and development (R&D) organisations – for example, by co-funding Technology Readiness Level (TRL)[2] 4-7 translation projects executed by multi-skills teams drawn from university researchers and research translation teams;
- provide support to enhance the marketing and promotion of industry PhDs;
- assist universities and industry to address skills gaps in key areas such as product design, product development, quality assurance, marketing and sales; and
- adopt a tiered approach to the funding of translation projects, where research projects involving small-to-medium enterprises (SMEs) receive higher subsidies.

[1] The Hon. Alan Tudge MP, Minister for Education and Youth (26 February 2021). 'Lifting the impact of universities to strengthen Australia's future'. Speech delivered at The University of Melbourne.
[2] Technology Readiness Levels as at https://www.nasa.gov/directorates/heo/scan/engineering/technology/txt_accordion1.html

ACU Feedback

Adopt a broad definition of research commercialisation and translation

The Scheme should adopt a broad definition of research "commercialisation". This should not narrowly focus on, for example, research geared to generating ideas to design products or technology that delivers large profits in a commercial private sector sense. It should also incentivise research with socioeconomic benefit or real-world application. Similarly, industry partnerships should be understood to include social or community partnerships, such as with health or education partners. Fundamentally, any definition of commercialisation under the Scheme must recognise the diversity of Australia's university sector and research landscape. Furthermore, any new metrics adopted to promote university research commercialisation should also be incorporated into existing research funding arrangements and national assessments such as ERA as they are significant incentivisation mechanisms for universities.

As a university with a unique specialisation and core strengths in Health and Education, ACU's key industry partners are the public sector and Health and Education services providers. Achieving "commercial outcomes", particularly in the public sector and service-delivery contexts, is about achieving efficiencies or improved outcomes.

For instance, research into disease prevention, or into new hospital management systems, can reduce government costs by lessening present and future burden on the healthcare system and increase workforce productivity. Such research produces a public benefit that supports national advancement but, under an unduly narrow definition, may not always be considered "commercialisation".

Examples of ACU research that delivers commercial outcomes, cost savings to government and efficiencies are provided in Box 1.

Box 1. Research at ACU

Improving acute stroke care outcomes: Stroke is the second leading cause of death and the third leading cause of disability world-wide. Despite international guidelines for stroke management, patients do not always receive evidence-based care. ACU has led seminal research demonstrating that use of protocols to manage fever, hyperglycaemia and swallowing (FeSS Protocols) following stroke significantly reduces death and dependency, resulting in sustained long-term survival. Implementing these protocols in even only 65% of eligible Australians would result in a $281 million saving over 12 months.[3] This work commenced in NSW but has now been adopted across Europe with expressions of interest from hospitals across 31 other countries.

***Tackling obesity through digital innovation*:** Physical inactivity, obesity and individuals carrying extra weight combine to be the single greatest risk factor for disease burden in Australia. To address this problem at an early stage of life, ACU researchers used nearly $2 million received in industry partnership grants (including from NSW Department of Education, Sport Australia, and Special Olympics Australia) to create a cost-effective intervention: "iPLAY". Trials showed that iPLAY enhanced the health and fitness of Australian children at scale, with results soon to be published in the world's top paediatrics journal, JAMA Pediatrics. By leveraging digital innovations, ACU has worked with 190 schools around Australia – including around 2,600 teachers – to get children more active. As a result of this program, 64,000 students are fitter. This low-cost intervention ($33 per student) is helping to head off the prevalent, damaging health risk.

[3] Independent economic evaluation by the Australian Commission on Safety and Quality in Health Care.

Lifting the status of the teaching profession: ACU researchers established the Graduate Teacher Performance Assessment (GTPA), a tool that assesses the practical skills and knowledge of final year Education students. The GTPA requires pre-service teachers to connect research, theory, and practice. It provides large-scale evidence of students' competence to work in a classroom environment and their ability to meet the Australian Professional Standards for Teachers at Graduate level. The GTPA gained Australian Institute for Teaching and School Leadership endorsement in 2018 and has since been adopted by fourteen higher education institutions in their initial teacher education programs. ACU's GTPA project team was awarded second place in the 2020 European e-Learning Excellence Awards.

Advancing exercise performance, recovery and sports technology: Performance, recovery and injury avoidance are fundamental to success in elite sport. ACU has recently partnered with NBA team the Sacramento Kings to give them access to world leading researchers and advances in performance, recovery and sports technology. Specialised training methodologies, individualised prevention and nutrition strategies, predictive analytics to manage fitness and fatigue, and wearable sensors for real-time performance monitoring and ultimately translation of research and knowledge into practice, are keys to the partnership.

Foster a holistic research landscape

Incentives for research commercialisation should not detract from incentives for basic research, which would inhibit Australia's broader research potential. As the Taskforce acknowledges:

> *To encourage and accelerate university commercialisation outcomes the existing paradigm will need to shift, whilst also maintaining our investment in research excellence and basic research.*[4]

Maintaining a holistic research landscape, where basic research is equally supported, is integral to aiding Australia's short-to-medium term recovery and supporting the nation's long-term success. Blue-sky research challenges and enriches Australia's research base and fosters innovation.

Publications and citations are also important for Australia to remain internationally competitive, as they are globally accepted measures of research quality and excellence. Australia's research agenda should not be inward-facing; rather, it must operate within the context of global research imperatives if Australia is to sustain a competitive edge.

The success of national efforts, such as the Global Talent Program, to attract high calibre international talent relies on international researchers being encouraged to continue to achieve globally-valued metrics while in Australia.

How to incentivise or support better industry-university collaboration

In most commercial R&D operations, the translation of new knowledge into products and services occurs through a multi-skilled workforce where researchers, designers and product developers are all involved in the new product pipeline. Australian universities could be incentivised to adapt such practices, whilst continuing to engage in basic research.

The Scheme could co-fund TRL 4-7 translation projects executed by multi-skilled teams drawn from university researchers and a research translation team. The research translation team may be employed directly by the university, outsourced or involved in a start-up. Figure 1, below, illustrates how such an arrangement could operate.

[4] Consultation Paper, p.4.

This recognises that successfully translating research into practice typically requires multiple actors and levels of expertise, encompassing:

- researchers (engaged purely in research or both research and research translation work);
- research translation experts;
- product/service developers;
- quality assurers; and
- administrators.

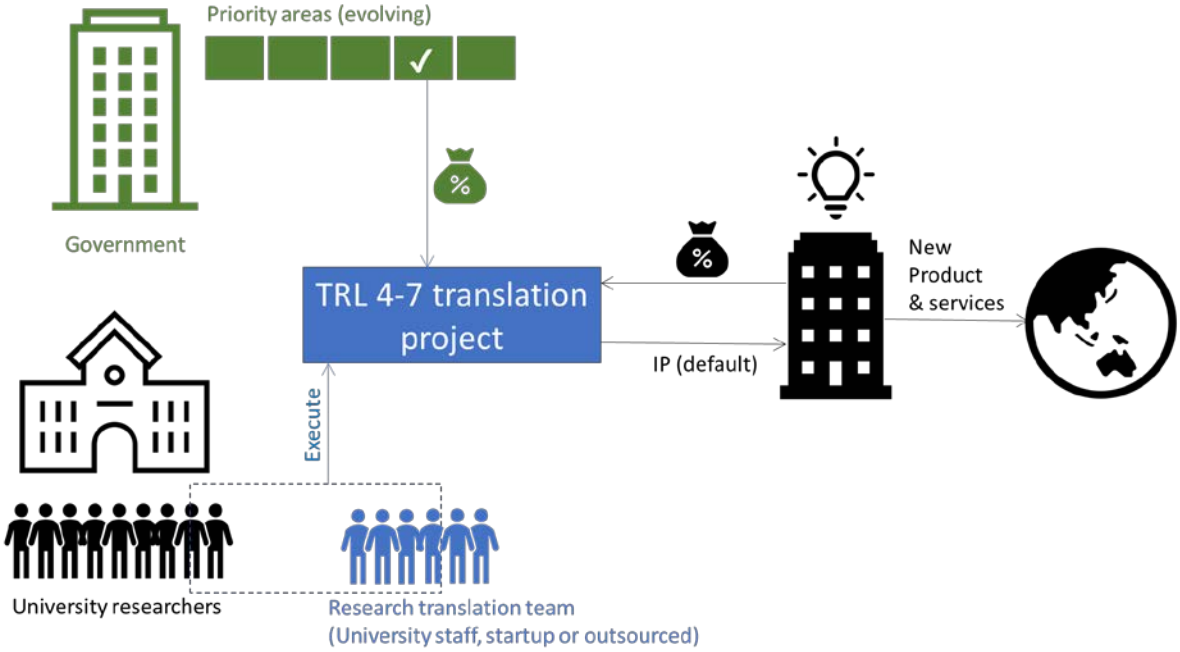
Such arrangements would lift the profile of university research and their capacities with industry, and encourage industry to come to universities to innovate or solve business and service delivery issues.

As the Education Minister has noted, Australian research too often falls into the "'valley of death' between academia and industry, between theory and real-world application".[5]

Researchers in this arrangement are not necessarily technology innovators. They may be involved in developing new cybersecurity technologies but they might also be domain knowledge experts, providing expertise on the latest discoveries in domains other than technology, such as health science, education, business, or arts.

In essence, this commercialisation model can translate both technology innovation and domain knowledge innovation. In the case of health and business/management research commercialisation, an additional component needs to be considered, as the ideas generation typically originates from health services clinicians and business practitioners in both the public and private sector.

Figure 1.



Industry PhD Programs to improve collaboration outcomes

Industry PhD programs contribute to breaking the silos between academia and industry, producing long-term cultural benefits. Examples of successful industry PhD programs in Australia include the Graduate Research Industry Partnerships (GRIP) program at Monash University, and the Industry Doctorate Program (IDP) at the University of Technology, Sydney. Overseas, successful programs include the Industrial Researcher Program in Denmark which

[5] The Hon. Alan Tudge MP, Minister for Education and Youth. (2021, 26 February). 'Lifting the impact of universities to strengthen Australia's future'. Speech delivered at The University of Melbourne.

supports industrial PhD and post-doctoral projects: candidates are employed by a private company and enrol at, or collaborate with, a public sector research organisation, and work on the same project at both institutions. Industry PhDs are also beneficial for the PhD candidate's career and their employing company's workforce development. However, the take-up of industry PhDs tends to be moderate.

The Scheme could support universities to improve marketing and communication to enhance the promotion of industry PhDs amongst industry and prospective candidates, to improve industry-university collaboration outcomes.

Skills gaps in academia/business that inhibit collaboration and commercialisation

University-industry collaboration and research commercialisation are inhibited by skills gaps in areas of product design, product development, quality assurance, product life cycle management, product marketing and sales. Even where researchers have the requisite skills, they may have insufficient time or scope within their roles to contribute to product development and innovation. Ensuring more researchers have the capacity to engage in such work and where appropriate, incorporating such work into KPIs, with adequate support and resourcing, could assist to address this deficiency.

Increasing collaboration between researchers and industry, particularly SMEs

SMEs constitute a high proportion of the Australian economy but typically have less capacity and appetite than larger businesses – which have the resources and economies of scale – to take on the financial risks and time commitments associated with engaging with research.

ACU recommends adopting a tiered approach to the funding of translation projects, where research projects involving SMEs receive higher subsidies. This additional support and incentive could encourage more SMEs to engage with university research.

Governance arrangements for the Scheme

Several governance models could potentially be adopted to support university-industry collaboration and research translation including joint-ventures, or research contracts between the university and a commercial organisation. In all cases, management of intellectual property (IP) should empower the partner who carries the commercialisation risks. To this end, the project IP can for instance be vested in the commercialising partner, whilst allowing the academic partner to utilise project IP for further knowledge discovery and teaching. ACU recommends a case-by-case basis approach to allow for a range of situations.

Selection and management of projects

Given the high levels of investment and risk involved in developing new product lines, commercial organisations tend to take an evidence-based approach to innovation and rely on measured market needs, as opposed to drawing from a pool of research ideas. This is often referred to as a "pull approach" instead of a "push approach". For this reason, in commercial R&D translation, successful projects more often start with an identified market opportunity (pull approach).

To keep industry engaged in the scheme, we recommend prioritising projects on the basis of:

- government-defined priority areas; and
- market need, as identified by industry partners.

To maintain scope for blue-sky innovation, however, a commensurate proportion of funding should also be dedicated to the development of "push" ideas.