emcrforum

THE VOICE OF AUSTRALIA'S FUTURE SCIENTIFIC LEADERS

Australian Academy of Science

Kick-starting Collaboration

Establishing a culture of engagement

A guide for decision makers

Australia's industrial landscape is undergoing a transformation. New industries are emerging and established industries are evolving to compete on the rapidly changing global stage. Cultural change to foster better industry–research collaboration is necessary for Australia to realise its potential.

There are currently several initiatives to facilitate and incentivise greater engagement of the research sector with industry, including industry growth centres, collaborative research funding, and changes to the block grant funding received by universities. In addition to these, we need to foster a culture of engagement within Australia. Developing a culture of engagement will allow directed facilitation and incentives to become seeds for long-term self-sustaining collaboration.

A healthy Australian science, technology, engineering and mathematics (STEM) research sector is critical for the ultimate competitiveness of industry. The research sector is defined here as research occurring within universities, at publicly funded research agencies, at independent research institutions, and within government departments.

Who is this guide for?

This guide is for decision makers with an interest in collaboration between the Australian research sector and industry. Whether you are in government, industry, university or elsewhere, you are in a position to support and influence the future of Australian innovation.

Facilitating flexible skills training in concert with industry

The Review of Australia's Research Training System[1] identified that many of the skills acquired during a PhD are the types of skills which employers in industry seek. However, employers may perceive that PhD training is inadequate preparation for a career in industry[2]. This disconnect can be addressed if we:

- **prioritise flexible, PhD candidate-directed transferable skill development.** We encourage universities to provide transferable skill training to PhD students and include it in their evaluation at completion, as well as providing realistic career outcomes (key findings 1, 4 and 9 from the Review of

Kick-starting collaboration between the research sector and industry requires a *culture of engagement*. Cultural change of this kind will foster individuals and organisations with diverse, agile, and innovative problem-solving capabilities. The Early- and Mid-Career Researcher (EMCR) Forum recognises that this benefits end users seeking solutions, and those, such as early- and mid-career researchers, seeking flexible careers in and around the research–industry nexus.

Australia's Research Training system). We also propose that the Government includes the quality of transferable skills training received by PhD students when evaluating universities for block grant funding.

- **coordinate support of researcher professional development.** Australia can build a nation-wide framework modelled on the UK Vitae system[3]. This scheme allows researchers to tailor their professional development opportunities to their areas of need, and provides a standard framework to demonstrate to employers the benefits researchers would bring to their business.
- **connect young researchers with their business counterparts.** Directly engaging early-career researchers with their counterparts in business will develop networks that last throughout their careers. Doing so will lead to a gradual change in culture, dispelling the perception that PhD training is inadequate for an industry career.

Benefits of flexible skills training

When Australia's Research Training Scheme produces candidates with the skills appropriate for industry, and industry employers recognise the value of employing PhD qualified staff, the ongoing return on investment from PhD training is maximised.

Connecting researchers with end users

In a culture of engagement there is a need for the research and industry communities to unite. Schemes and processes already exist to connect a known problem with potential solutions (e.g. Innovation Connections scheme, OnPRIME, hackathons). As-yet untapped relationships are connections between those who don't yet know they have a problem and those who don't yet realise they have a solution. This can be addressed if we:

- **promote cross-sector understanding.** The EMCR Forum has produced three guides for early- and mid-career researchers (EMCRs) to help them understand the landscape and what motivates research in different sectors. The guides include case studies of EMCRs working across sectors to show how it can be done. Our Kick-starting Collaboration website also contains links to resources to help EMCRs excel in collaboration. www.science.org.au/kick-starting-collaboration
- **embed mentoring programs.** Embedding the mentor relationship as standard practice across the research sector will provide EMCRs with increased understanding of the sector and of industry and government. It will grow EMCR networks inside and outside the research sector that will lead to successful collaborations. Employers can establish a culture of mentoring by including mentorship in performance evaluation for all staff, incentivising everyone to be both a mentee and a mentor. The successful IMNIS program[4], which pairs PhD students with leaders in industry and government, can act as an exemplar to the sector to encourage more widespread establishment of mentoring.
- **implement the Career Flexibility Project.** This proposed initiative of the EMCR Forum promotes mobility between sectors. It includes the creation of a centralised online database of Australian STEM EMCRs who are accessible to industry partners. The database will facilitate dialogue for solving the big questions and problems facing industry and government.

Benefits of creating connections

A more connected culture—where researchers across the research sector interact daily with researchers and professionals in industry and government—will normalise collaboration across sectors and promote innovation.

Changing how we measure research success

Many areas of the research sector continue to focus on publications as the major method of assessing research success. Researchers in industry are assessed on their contribution to the ongoing financial viability of their business, typically involving product development and intellectual property generation. A focus on such narrow and disparate criteria has created a culture which inhibits mobility.

It also disincentivises researchers to develop broader skill sets—the types of skills employers and collaborators in other sectors are looking for. To address this we recommend:

- **understanding that research impact transcends sector boundaries.** The research sector should embrace performance assessment which encompasses the societal and economic benefits of research. In 2017 the ARC piloted the engagement and impact assessment[5] which will run alongside Excellence in Research for Australia (ERA) in 2018 as part of Australia's national research evaluation. This assessment provides a framework to directly reward universities for collaboration, translation and commercialisation.
- **rewarding research with impact.** To respond effectively to the engagement and impact assessment, research sector employers need to incorporate these factors into their assessment of research at multiple levels: in performance reviews of individual employees, during recruitment processes, and at the department or institution level. Funding bodies such as the ARC and NHMRC should embed measures of research engagement and impact into track record criteria for awarding grant funding.
- **creating a workforce with a more diverse skill-set.** Individual managers need to reward and allow time for their employees to engage in non-traditional research activities which lead to engagement and impact. This includes involvement in social media, mass media, blogs, public lectures, community engagement, public policy work, industry or research collaboration, and establishment of start-ups or spin-offs.

Benefits of rewarding research impact

When researchers are operating within a culture that values impact they will take part in activities and seek out skills that facilitate it, resulting in a collaboration-ready workforce. A common metric system based on impact and engagement provides clarity to employers when assessing individuals for suitability and capability to undertake employment in any sector, facilitating seamless mobility between sectors.

Celebrate STEM PhD graduates working outside of universities

Longitudinal studies from the Royal Society in the United Kingdom[6] identify that a non-academic career is the majority pathway for PhD graduates. Despite this it is currently viewed as scientific failure. However, the meaningful contribution of STEM PhD educated people to all sectors of society should be celebrated as success. To do this we should:

- **create STEM career pathways.** Recent PhD graduates need to understand how their training equips them for a diversity of careers. Projects like the Jobs Explorer pilot (and its future commercial product), which allow government to understand where STEM PhD skills are required in the job market, can also be used by recent PhD graduates to identify jobs that match their skills, even if these positions do not explicitly require a PhD.
- **implement the Career Flexibility Project.** This proposed initiative of the EMCR Forum promotes mobility between sectors. It would include video and online content to help EMCRs recognise their transferable experience, as well as resources for EMCRs to obtain new and relevant skills to pursue careers outside their current sector.
- **champion diverse role models.** Identifying and promoting as role models STEM-educated people leading successful careers outside the traditional research pathway, and those who have switched between sectors, is vital. This should include short videos designed for social media and other ways of engaging young researchers.

Benefits of diverse STEM career pathways

Preparing PhD graduates for diverse careers inside and outside research maximises return on investment from government-funded PhD training. It also enables EMCRs to move fluidly between jobs in industry, universities and government throughout their careers. A mobile STEM workforce injects innovation into diverse streams of the economy.

WHAT NEXT?

Australia's EMCRs are poised to contribute to shaping our collective future. They are armed with complex problem-solving skills necessary for tomorrow's challenges. By establishing a culture of engagement, EMCRs can make meaningful contributions to all areas of society and help break down the barriers that are currently slowing Australia's industrial transformation.

The EMCR Forum wishes to work with Australia's decision makers to support a lasting legacy of collaboration, innovation and cross-sector engagement.

Leaders in research sector

- Prioritise transferable skills in research training
- Read 'Big ideas to spark collaboration', case studies and resources on our website
- Incentivise mentoring
- Champion diverse role models
- Implement impact and engagement metrics to measure individual performance

Leaders in industry

- Incentivise mentoring in your business
- Take part in mentoring programs for researchers outside industry
- Encourage engagement at all levels of your business with the research sector
- Champion diverse role models

Leaders in government

- Include quality of transferable skill training in assessment for block research funding
- Read 'Big ideas to spark collaboration', case studies and resources on our website
- Take part in mentoring programs
- Champion diverse role models
- Ensure funding bodies integrate metrics that focus on outcomes, impact and engagement in their assessments

EMCRs

- Take part in mentoring programs
- Make use of our guides and other resources on the website
- Consider your transferable skills when assessing your professional development
- Become a member of the EMCR Forum and add your voice to EMCRs around the country to help create change. www.science.org.au/emcr-membership-registration

1 McGagh, J, Marsh, H, Western, M, Thomas, P, Hastings, A, Mihailova, M, Wenham, M (2016) *Review of Australia's Research Training System.* Report for the Australian Council of Learned Academies, www.acola.org.au

2 Roberts, R (2002) The supply of people with science, technology, engineering and mathematics skills: The report of Sir Gareth Roberts Review, HM Treasury.

3 The Vitae researcher development framework planner. Vitae Careers research Advisory Centre Limited. www.vitae.ac.uk/researchers-professional-development/about-the-vitae-researcher-development-framework-planner

4 Industry mentoring Network in STEM. www.imnis.org.au

5 www.arc.gov.au/engagement-and-impact-assessment

6 The Royal Society 2010 The Scientific century: securing our future prosperity. www.royalsociety.org

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Get in contact with the EMCR Forum

The EMCR Forum is the voice of Australia's early- and mid-career researchers (EMCRs), championing improvement in the national research environment through advocacy.

Connect

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Visit www.science.org.au/kick-starting-collaboration to find out more about this project.