

**NITRO-Oceania Online Submission
to
Australian Universities Accord Panel
on
Priorities for the Australian Universities Accord**

Prepared by Professor Gabriele Bammer on behalf of the NITRO-Oceania Executive and submitted on 16 December 2022.

Key points about the review:

“The Government has committed to establish an Australian Universities Accord to drive lasting reform in Australia’s higher education system.... The panel will make recommendations for Government, the sector and other relevant stakeholders to deliver a higher education system that meets the current and future needs of the nation, and targets to achieve this.”

And

From Review Chair: “I ask that your response to this initial request is focused to identify your priorities for the Review process.”

The submission was posted in response to areas 1 and 7 of the 7 key areas for review as these are the most salient for NITRO-Oceania:

#1 Meeting Australia’s knowledge and skills needs, now and in the future

- Enhance the delivery of quality education that meets the needs of students across all stages of lifelong learning and develops the skills needed now, and in the future. This will include recommendations for new targets and reforms recognising that more than nine in ten new jobs will require post-school qualifications, and fifty per cent of new jobs are expected to require a bachelor’s degree or higher.

#7 Delivering new knowledge, innovation and capability

- Support a system of university research that delivers for Australia, securing the future of the Australian research pipeline, from basic and translational research to commercialisation. In doing so, the Accord will explore relevant initiatives and other opportunities and to further boost collaboration between universities and industry to drive greater commercial returns.
- The review will synchronise with the ARC review and consider issues raised through that review and other areas of government that impact on the capacity of the higher education system to meet the nation’s current and future needs.

#1 Meeting Australia’s knowledge and skills needs, now and in the future

PRIORITY ISSUE: NITRO-Oceania urges the Australian Universities Accord Panel to prioritise examination of the further development of transdisciplinary problem-solving skills in all Australian university undergraduate and postgraduate degrees, along with how this needs to be supported by appropriate institutional arrangements, including quality assurance programs and revision of the Field of Education (FOE) codes.

SUPPORTING INFORMATION

Across Australian universities and internationally, there is recognition that discipline-based skills, while important, are not enough to equip students to play their part in addressing major societal and environmental challenges in their post-graduation careers.

Regardless of whether a student forges a career in public service, business, civil society or elsewhere, they need to be adept at transdisciplinary problem solving. This requires an ability to:

- work effectively in teams with diverse expertise
- engage, respectfully listen to, and incorporate the concerns of stakeholders affected by problems under consideration
- become, or develop the capacity to support, effective decision makers, which involves honing skills in: critical thinking, overcoming cognitive biases, preparing for and managing adverse unintended consequences, avoiding disastrous tipping points, and understanding and working within the complexity of change processes
- appreciate and work with the opportunities and constraints provided by political, historical, economic, cultural and other aspects of context
- understand and work with the systemic nature of problems and solutions, especially the importance of connections and interdependencies. It also requires effectively managing imperfection, in that problems can never be fully understood and solutions will only ever be partial and temporary.

A growing number of undergraduate and postgraduate courses and programs in all universities are providing skills in at least some of these areas. Two universities have made undergraduate expertise in transdisciplinary problem solving central to their educational mission:

- The Australian National University has introduced three graduate attributes, which all undergraduates will be expected to attain by the end of their undergraduate degrees, one of which is “*Capability to Employ Discipline-based Knowledge in Transdisciplinary Problem Solving.*” This will be rolled out starting in 2025 (<https://services.anu.edu.au/planning-governance/current-projects/anu-undergraduate-curriculum-framework>).
- University of Technology Sydney, while not introducing transdisciplinary problem-solving skills as a graduate attribute, nevertheless will require all undergraduate students to undertake one of 8 transdisciplinary electives or the *Bachelor of Creative Intelligence and Innovation*, starting in 2023 (<https://www.uts.edu.au/study/transdisciplinary-innovation/undergraduate-courses/td-electives-program>).

#7 Delivering new knowledge, innovation and capability

PRIORITY ISSUE: NITRO-Oceania urges the Australian Universities Accord Panel to prioritise the strengthening of transdisciplinary research across the university sector in developing transformational impact on global societal and environmental challenges, fostering new knowledge and innovation, and enhancing translational research for commercialisation. This needs to be supported by appropriate institutional arrangements, including research funding, revision of the Field of Research (FOR) codes, and documentation and evaluation of impact.

NITRO-Oceania has made a separate submission to the review of the Australian Research Council urging the establishment of a working group to determine how support for interdisciplinary and transdisciplinary research can be strengthened, including:

- Examining the success rates and qualitative experience of researchers submitting interdisciplinary and transdisciplinary research proposals
- Drawing on the experience of international funders in supporting such research
- Developing criteria for expert panels, as well as application and review processes
- Reviewing changes that need to be made to structures and processes outside the ARC’s sole control that can impact on support for interdisciplinary and transdisciplinary research, for example the Field of Research (FOR) codes.

SUPPORTING INFORMATION

Transdisciplinary research combining the insights of multiple disciplines and stakeholders, along with interdisciplinary research at the interfaces and overlaps of different disciplines, are major engines for generating new knowledge. Transdisciplinary public good research generates key new knowledge to inform sustainability, population health, governance and regulation, and much more.

Transdisciplinary research is critical not only for public good knowledge generation, but also for fostering innovation that can lead to commercialisation. A landmark report recognising this is the 2014 US National Research Council report “*Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond*” (Washington, DC: The National Academies Press. <https://doi.org/10.17226/18722>). Success stories are available at: <https://beta.nsf.gov/od/oia/ia/growing-convergence-research-nsf>.

Transdisciplinary research is increasingly practiced in Australian universities to achieve transformational impact on global societal and environmental challenges, with the following providing a tiny number of examples:

- The TD School at University of Technology Sydney
- The Monash Sustainable Development Institute
- The ANU School of Regulation and Global Governance (RegNet)
- The Centre for Marine Socioecology at University of Tasmania
- The Centre for People, Place and Planet at Edith Cowan University
- Research in the Great Barrier Reef at Central Queensland University.

Although there is considerable anecdotal evidence of positive impact, success stories are poorly documented, and the documentation that exists is fragmented; see, for example.

- <https://nitro-oceania.net/success-stories/>
- <https://icedcs.anu.edu.au/research/research-stories>
- <https://www.uts.edu.au/sites/default/files/2022-06/ISF%20Our%20approach%20to%20impact.pdf>

Although transdisciplinary research has largely been developed in public good contexts, it is a form of translational research that is also applicable to commercialisation. It has distinct benefits in that it:

- works closely with the stakeholders whose problems are being “solved,” ensuring that their perspectives and concerns have been properly considered.
- takes a systemic and context-based approach that pays attention to:
 - political, historical, economic, cultural and other opportunities and constraints,
 - potential adverse unintended consequences and disastrous tipping points
- involves critical thinking drawing on insights from multiple disciplines and areas of practice, that includes highlighting traps inherent in multiple cognitive biases.

ABOUT NITRO-OCEANIA

NITRO-Oceania, the Network of Leaders of Interdisciplinary and Transdisciplinary Research Organisations in the Oceania region, is the peak body for interdisciplinary and transdisciplinary research and education in Australia and the wider region. 52 of our more than 70 members are in leadership positions in 18 Australian research and education organisations.

Our mission is inspiring and supporting researchers to achieve transformational impact on global challenges by:

- Fostering attention to grand challenges of particular significance to the Oceania region
- Creating supportive environments and infrastructure
- Developing effective metrics for excellence, impact and return on investment
- Improving funding availability and outcomes
- Supporting next generation organisational leaders
- Providing effective career paths and role models for interdisciplinarians and transdisciplinarians at all levels, and especially to support early-career researchers
- Developing workable transition pathways to implementation of new metrics and effective career paths.

More information about NITRO-Oceania can be found at <https://nitro-oceania.net/>.

DEFINITIONS

The terms interdisciplinary and transdisciplinary are often used interchangeably and also cover territory identified by the terms systems thinking, post-normal science, action research, convergence research and, for specific types of problems, sustainability science.

Simply put, transdisciplinary research and education involve identifying and bringing together a range of relevant perspectives from disciplines and key groups in society to develop a more comprehensive understanding of a multi-faceted issue and to determine the best possible way forward, as well as the most appropriate and effective implementation strategy.

There is value in also singling out research and education that concentrate on the interfaces among disciplines and restricting the use of “interdisciplinary” to such instances.

In this submission we have mainly focused on transdisciplinary research and education.