

NITRO-OCEANIA ONLINE SUBMISSION TO THE ARC REVIEW

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The submission was posted in response to question 10 in the ARC review terms of reference:

Having regard to the Review's Terms of Reference, the ARC Act itself, the function, structure and operation of the ARC, and the current and potential role of the ARC in fostering excellent Australian research of global significance, do you have any other comments or suggestions?

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 in Australia and the wider region. 52 of our more than 70 members are in leadership positions in 18 Australian research organisations. We are keenly interested in research funding and particularly in appropriate recognition of, and support for, interdisciplinary and transdisciplinary research. More information about NITRO-Oceania can be found at <https://nitro-oceania.net/>.

Interdisciplinary and transdisciplinary research are critical to achieving transformational impact on global challenges.

We urge the ARC review to recommend 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.**

NITRO-Oceania stands ready to assist in the development and operation of such a working group.

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 involves 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 that concentrates on the interfaces among disciplines and restricting the use of "interdisciplinary" to such instances.

Building on past ARC successes

In 2015 then ARC CEO Professor Aidan Byrne co-convened a one-day workshop with a group of senior scholars with track records of interdisciplinary research, titled “Interdisciplinary Research: Evaluating and Rewarding High-Quality Projects.”

Two key recommendations from that meeting were implemented:

1. “That the ARC add a yes/no tick box to grant applications to identify if the proposal is interdisciplinary, plus room for a statement of up to 50 words to explain what is interdisciplinary about the proposal over and above the combination of FoR codes.”
2. “That the ARC analyse the success rates of interdisciplinary applications, using Field of Research (FoR codes) and other existing data...”

This second recommendation led to the publication:

Bromham L, Dinnage R & Hua X (2016) Interdisciplinary research has consistently lower funding success. *Nature* 534: 684-687. doi:10.1038/nature18315.

The ARC also played an important role in the 2016 Global Research Council Statement of Principles on interdisciplinarity

https://globalresearchcouncil.org/fileadmin/documents/GRC_Publications/Statement_of_Principles_on_Interdisciplinarity.pdf.

Subsequently the ARC undertook major developments in Engagement and Impact Assessment, although the role of transdisciplinary research in fostering effective engagement and impact was largely missed.

As part of the current review of the ARC, we urge attention to building on these important foundations and to revitalising the ARC’s role in supporting interdisciplinary and transdisciplinary research.

Examining the success rates and qualitative experience of researchers submitting interdisciplinary and transdisciplinary research proposals

A working group would be well-placed to examine how effectively the ARC is supporting interdisciplinary and transdisciplinary research in Australia. Is it still the case, as Bromham and colleagues found in 2016, that interdisciplinary research has a lower funding success rate in ARC rounds? If so, to what can this be attributed eg poorer quality applications, inadequate assessment processes or some combination of both?

It would be helpful to conduct a follow-up analysis to that undertaken by Bromham and colleagues, as well as to collect qualitative data from successful and unsuccessful applicants.

The interdisciplinary and transdisciplinary research landscape in Australia has changed dramatically since 2015-6, with many universities and other research organisations embedding specific interdisciplinary and transdisciplinary research institutes, schools, centres, programs and platforms, such as (to mention just a few):

- 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

- CSIRO's Valuing Sustainability Future Science Platform.

This burgeoning of attention within universities and other research organisations leads to the question: How has this impacted funding applications to the ARC and their success rate?

Drawing on the experience of international funders in supporting such research

A working group could learn a considerable amount from a range of international funders, who specifically support interdisciplinary and transdisciplinary research, including (to name just a few):

- Convergence research funded by the National Science Foundation:
<https://beta.nsf.gov/od/oia/ia/growing-convergence-research-nsf>
- Horizon Europe, the EU's key funding programme for research and innovation
https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en
- The Belmont Forum <https://www.belmontforum.org/>
- The Swiss National Science Fund's National Research programmes
<https://www.snf.ch/en/72rlhXHBaKDrfXPe/page/national-research-programmes-nrps>
- The Austrian Science Fund's #ConnectingMinds Program
<https://www.fwf.ac.at/en/research-funding/fwf-programmes/connectingminds>.

Lessons to be drawn from these and other funders include:

- how they solicit applications
- how they build capacity among researchers in interdisciplinary and transdisciplinary research skills
- How they assess proposals
- How they evaluate proposal outcomes.

For example, NITRO-Oceania members have direct experience in working with these and other international funders of transdisciplinary research proposals and can comment on different assessment methods. One which works well is where separate assessors independently consider the problem-based merits and the transdisciplinary merits of a proposal. Proposals may be leading edge in both, or may be innovative in their approach to the problem but weak in their transdisciplinarity and vice-versa. Assessing these two aspects separately ensures that only the most deserving are funded.

Developing criteria for expert panels, as well as application and review processes

Growing Australian experience and expertise in interdisciplinary and transdisciplinary research, combined with international experience in funding such research provides a strong foundation for a working group to consider how to strengthen the processes used by the ARC to support and assess interdisciplinary and transdisciplinary funding applications.

There is also a growing peer-reviewed literature to draw on, for example:

- Schneider, F., Buser, T., Keller, R., Tribaldos, T. and Rist, S. (2019). Research funding programmes aiming for societal transformations: Ten key stages. *Science and Public Policy*, scy074: 1-16. (Online – open access) (DOI): <https://doi.org/10.1093/scipol/scy074>.
- Cundill, G., Harvey, B., Tebboth, M., Cochrane, L., Currie-Alder, B., Vincent, K., Lawn, J., Nicholls, R.J., Scodanibbio, L., Prakash, A., New, M., Wester, P., Leone, M., Morchain, D., Ludi, E., DeMaria-Kinney, J., Khan, A. and Landry, M. E. (2018). Large-scale transdisciplinary collaboration for adaptation research: Challenges and insights. *Global Challenges*, 3, 4: 1700132. (Online – open access) (DOI): <https://doi.org/10.1002/gch2.201700132>

In addition, there is a growing literature on identifying the expertise and institutional leadership required, some of which NITRO-Oceania members have been prominent in producing. Examples are:

- Hoffmann, S., Deutsch, L., Klein, J.T. *et al.* Integrate the integrators! A call for establishing academic careers for integration experts. *Humanit Soc Sci Commun* 9, 147 (2022). <https://doi.org/10.1057/s41599-022-01138-z>
- Bammer, G., O'Rourke, M., O'Connell, D., Neuhauser, L., Midgley, G., Klein, J.T., Grigg, N.J., Gadlin, H., Ellum, I.R., Bursztyn, M., Fulton, E.A., Pohl, C., Smithson, M., Vilsmaier, U., Bergmann, M., Jaeger, J., Merx, F., Vienni Baptista, B., Burgman, M.A., Walker, D.H., Young, J., Bradbury, H., Crawford, L., Haryanto, B., Pachanee, C., Polk, M., Richardson G.P. 2020 'Expertise in research integration and implementation for tackling complex problems: when is it needed, where can it be found and how can it be strengthened?' *Palgrave Communications* 6, 5. doi:10.1057/s41599-019-0380-0 <https://www.nature.com/articles/s41599-019-0380-0>
- Gordon, I.J., Bawa, K., Bammer, G., Boone, C., Dunne, J., Hart, D., Hellmann, J., Miller, A., New, M., Ometto, J., Pickett, S., Wendorf, G., Agrawal, A., Bertsch, P., Campbell, C.D., Dodd, P., Janetos, A., Mallee, H., Taylor K. 2019 'Forging future organizational leaders for sustainability science' *Nature Sustainability* 2: 647-649; doi:10.1038/s41893-019-0357-4.

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.

A working group also needs to examine other factors influencing the ARC's ability to support interdisciplinary and transdisciplinary research. Prominent among these are the Field of Research (FOR) codes.

The only way that interdisciplinary and transdisciplinary research can be recognised in the FOR Codes system is by combinations of codes. A strong case can be made for recognition of interdisciplinary and transdisciplinary research expertise through their own FOR codes and the door to such considerations was opened by the 2019-2020 joint review of the Australian and New Zealand Standard Research Classification (ANZSRC) conducted by the Australian Research Council (ARC), Australian Bureau of Statistics (ABS), Statistics New Zealand (Stats NZ), and the New Zealand Ministry of Business, Innovation and Employment (MBIE). NITRO-Oceania's submission to the review is available at: https://nitro-oceania.net/wp-content/uploads/2019/06/NITRO_submission_ANZ-research-classification-review_2019_classifying-ID-and-TD-research.pdf

Although that joint review did not introduce a new field of research code for "interdisciplinarity" (which was the term under consideration), it did recognise the challenges on p7 of its report: *"Interdisciplinary and multidisciplinary research by their very nature pose difficulties for any R&D classification. Stakeholder feedback was sought on how ANZSRC could be revised to better classify interdisciplinary and multidisciplinary research. The Review found that there was no viable solution that could be applied to the classification to resolve or avoid this issue."*

The report went on to say:

"Feedback indicated that in most instances, allowing users to assign multiple codes to research data, or apportion research across multiple codes, is adequate to capture interdisciplinary and multidisciplinary research. This treatment allows users sufficient flexibility to code their research satisfactorily without overly complicating the structure of ANZSRC and without producing overlapping codes."

NITRO-Oceania members reviewed the submissions (https://nitro-oceania.net/wp-content/uploads/2020/02/NITRO-Oceania-2020-response_ANZSRC-review.pdf), noting that this second conclusion was based on only 24% of the public submissions commenting on multidisciplinary, interdisciplinary and transdisciplinary research, with the rest calling for more substantial reforms.

While it is unlikely that a solution to these issues will be found quickly, their importance means that they deserve on going attention, especially taking into account national and international developments.

Conclusion

The review of the ARC is timely and addresses key issues for the funder's future development. It also provides an important opportunity to revisit how the ARC can better contribute to supporting interdisciplinary and transdisciplinary research. In our submission we provide evidence of growing attention to interdisciplinary and transdisciplinary research nationally, along with growing funding opportunities internationally. As the peak body for interdisciplinary and transdisciplinary research in Australia and the wider region, NITRO-Oceania calls for the ARC review to recommend the establishment of a working group to determine how support for interdisciplinary and transdisciplinary research can be strengthened, and stands ready to assist in such an endeavour.