



## Network of Interdisciplinary and Transdisciplinary Research Organisations – Oceania

<http://nitro-oceania.net>

### Response to Consultation Draft of the Australian and New Zealand Standard Research Classification (ANZSRC) Review 2019

#### Appropriately classifying multidisciplinary, interdisciplinary and transdisciplinary research

Thank you for the opportunity to respond to the consultation draft produced by the Australian and New Zealand Standard Research Classification (ANZSRC) review and to read the public submissions that were made.

While we were delighted that the appropriate classification of “interdisciplinary and multidisciplinary research” was to be included in the Review’s considerations, we are extremely disappointed in the draft conclusions drawn from the consultation, especially as they do not seem to reflect the majority of submissions made.

We note that the draft conclusions are that:

*Interdisciplinary and Multidisciplinary Research Feedback through the initial public consultations 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. No specific changes have been made in the draft to the classification of interdisciplinary and multidisciplinary research.*

We further note that no summary or analysis of the responses to the discussion paper are provided.

In the attachment to this submission, we provide a simple cut-and-paste from the public submissions, drawing on those that commented on multidisciplinary, interdisciplinary and transdisciplinary research. Most of these respondents acknowledged the increasing importance of such research and the need for it to be more appropriately represented in the classification system.

We highlight in yellow those that suggest that the current classification system is “adequate.” We note that these represent 24% of the public submissions commenting on multidisciplinary, interdisciplinary and transdisciplinary research.

We appreciate that there is no “quick fix” to the challenges posed by the classification of interdisciplinary and multidisciplinary research. Rather than denying or glossing over the complexities, we urge the review to add the following in its final report:

- Submissions suggested that transdisciplinary research should be added to the review’s considerations
- Submissions demonstrated multiple understandings of multidisciplinary, interdisciplinary and transdisciplinary research and highlighted that these require clarification

- While some respondents found the current classification system to be adequate, the majority of submissions argued that changes were needed
- There is no easy way to bring multidisciplinary, interdisciplinary and transdisciplinary research into the current classification system, both because of the lack of definitional clarity and because the nature of this research (especially interdisciplinary and transdisciplinary research) may require a different approach to classification from that which works for discipline-based research.

We urge the review to set in train an analysis and consultation process to consider the complexities involved in appropriately classifying multidisciplinary, interdisciplinary and transdisciplinary research. The consultation process should involve a wide range of organisations and individuals involved in multidisciplinary, interdisciplinary and transdisciplinary research, and where appropriate draw on international expertise.

As the peak body for interdisciplinary and transdisciplinary research organisations in the Oceania region we stand ready to assist in such a process. Our expectation is that the next review of the Australian and New Zealand Standard Research Classification (ANZSRC) would then be able to start to set in place a more adequate classification of multidisciplinary, interdisciplinary and transdisciplinary research.

Yours sincerely

The Australian and New Zealand members of the NITRO-Oceania Executive:

Gabriele Bammer, The Australian National University (contact for further information:  
Gabriele.Bammer@anu.edu.au)

Paul Bertsch, Science Director, CSIRO Land and Water and Queensland Chief Scientist

Iain Gordon, The Australian National University

Tayanah O'Donnell, Future Earth Australia, Australian Academy of Science

Ken Taylor, Director, Our Land and Water National Science Challenge, New Zealand

**Summary of Responses to Australian and New Zealand Standard Research Classification  
(ANZSRC) Review 2019  
Concerning the appropriate classification of interdisciplinary and multidisciplinary  
research**

Submissions supporting the current system as adequate are highlighted in yellow.

**005 Sydney Health Ethics, University of Sydney (Contact: Associate Professor Ainsley Newson ainsley.newson@sydney.edu.au)**

Q10 Better capturing interdisciplinary/multidisciplinary work

Our centre undertakes research that is both interdisciplinary and multidisciplinary. We strive to code it accordingly, but this can generate problems (beyond the scope of this review) such as an activity that requires assessment across two grant panels. While we find it difficult to suggest a solution that will best capture this kind of work, we are encouraged that it is being considered. We do submit that the level to capture this likely needs to be at the Group level; to provide a signal as to the broad disciplines involved. However, an inter/multidisciplinary aspect to research could be more of an 'asterisk' to indicate the method, rather than a category in itself. We worry that if a new set of ToR FoR or SEO were to be developed for inter/multidisciplinary research, then this would make a 'miscellaneous' category more so, rather than a meaningful way to categorise research.

**009 Rena Friswell, Transport and Road Safety (TARS) Research Centre, School of Aviation, University of New South Wales ([r.friswell@unsw.edu.au](mailto:r.friswell@unsw.edu.au))**

*Recommendation regarding established Interdisciplinary and Multidisciplinary research areas*

I suggest that the Review considers creating a new Division of FoRs codes and SOE codes for Interdisciplinary and Multidisciplinary Research, with subordinate Groups, Fields and Objectives relating to particular research areas. In my view, transport safety would be one such area. It could be broken down by transport mode and occupational vs non-occupational transport use, but consultation with the community of transport safety researchers in Australia and New Zealand should inform the development any specialised coding structure.

**015 Languages and Cultures Network for Australian Universities (Contact Professor Jean Fornasiero [jean.fornasiero@adelaide.edu.au](mailto:jean.fornasiero@adelaide.edu.au))**

**Interdisciplinary research**

We see difficulty with trying to code areas that may be transitory or with secondguessing emerging areas. In such examples, cross-coding should be greatly supported as the most flexible way of mapping changing and evolving practices of collaboration.

On the other hand, where longstanding multidisciplinary structures exist, these should be recognized and allowed to function without fragmentation, as in the examples we have raised concerning Studies In Languages and Cultures and Indigenous Studies.

**016 Department of Industry, Innovation and Science (Contact not given)**

How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

The R&D Tax Incentive frequently uses MHLS (medical, health and life sciences) as a multidisciplinary research category. Another FoR with possible overlaps between disciplines is ICT (Information and Communication Technologies).

**019 Australian National University (Contact not given)**

*How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

ANZSRC is informed by the principle of mutual exclusivity, which leads interdisciplinary research to be allocated to relevant Fields of Research without adequate recognition of the specific inter- or multidisciplinary character of the research. Interdisciplinary research has been recognised by the Engagement and Impact Assessment as being outside of, but complementary to, the Field of Research structure.

Some inter-disciplinary endeavours will fit with a weighted attribution across a few areas, and that remains appropriate. However, research synthesising many disciplines towards a complex problem could genuinely sit outside the current Divisions. Research that studies and seeks to improve the practice of multi-, inter- and trans-disciplinarity is also not adequately described by the current ANZSRC, and opens a broader question about treatment of 'research on research practices'.

Due to the complexity of these issues, we recommend that the review consider and test multiple options with a more targeted consultation around inter- and multidisciplinary research, involving the interdisciplinarity research community.

**020 Deakin University (Contact Professor Julie Owens.)**

*10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

The importance of identifying and recognising both interdisciplinary and multidisciplinary research is recognised by Deakin University as the value to such collaborations are vital if the nation is to effectively respond to and address current and future complex and pressing research questions. Having said that, it is difficult to imagine a simple way of capturing interdisciplinary and multidisciplinary research within the FOR hierarchy.

As a first step it will be important to define and differentiate between interdisciplinary and multidisciplinary research in order to consider how both of these might be adequately captured. The University would suggest using the following definition (provided by Stember M 1991 *Journal of Social Sciences* 28: 1) - Multidisciplinary: people from **different** disciplines working together, each drawing on their disciplinary knowledge. **Interdisciplinary**: integrating knowledge and methods from **different** disciplines, using a real synthesis of approaches."

Once a definition is adopted, it will be critical to consider why this differentiation is necessary and why there is a need to capture it. If the differentiation will result in changes to funding models or the allocation of grant funding, there is a high risk of its introduction and measurement leading to changes in institutional behaviours to gain strategic benefit. If there is simply a recognition of the intrinsic value of interdisciplinary and/or multidisciplinary research or a recognition that there is value in measuring the level of such endeavour to assess its relative effectiveness in addressing key research questions (without any link to reward for conducting such research) then the resultant data is likely to be more reliable and thus trustworthy.

Provision already exists to recognise interdisciplinary/multidisciplinary research by assigning percentage weightings to research outputs and there is a risk that by having a catch-all interdisciplinary or multidisciplinary FOR code it would obscure the disciplines that form the basis of the cross-disciplinary collaboration. Another option might be to duplicate each FOR code to allow a researcher to select the interdisciplinary/multidisciplinary option for that code however this would seem unnecessarily unwieldy. It may be better to institute a secondary "Type of Activity" code that could be associated with the primary four types that would allow researchers to select whether their research involved either interdisciplinary or multidisciplinary research. Trans-disciplinary research also needs to be recognised as part of the above as it not only draws on multiple disciplines to provide the knowledge base to address problems of sustainability - it actively involves *researchers* from multiple disciplines in a shared process of defining and resolving these problems.

Deakin University believes there may be merit in trying to identify these three types of collaborations but acknowledges that definitions and validation will be a challenge.

**023 University of Melbourne (Contact: Professor Julie McLeod)**

The University also acknowledges the importance of inter and multidisciplinary research and the difficulty of capturing it within a code-based classification system. The mutual exclusivity principle can restrict the ability of a classification system to capture inter and multidisciplinary research, particularly when external reporting requirements entail restrictions on the number of codes that can be applied to research. Internal University systems allow 'many' codes to be attached to research projects and outputs and suggest that this principle needs to be adopted more widely so that inter and multidisciplinary research can be accurately captured.

**026 Society for the History of Emotions (Contact: not given)**

10. How can the FOR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

We have suggested above that the History of Emotions might most comfortably sit at a Group level if the current classification system largely remains intact. One of the key issues for us is that we have a distinct methodology that is not simply a merging of two other disciplinary approaches. Some other forms of interdisciplinary work can more easily signal their priorities through combining codes. However, the current 6-digit system is not particularly fit for purpose in enabling this for the reasons outlined above.

**030 University of South Australia (Contact: Simon Beecham)**

**10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?**

*We suggest that in each 2-digit field, include a signifier of interdisciplinary attached, such as a letter.*

*This is more of an issue with the policies, funding and evaluations that utilise the FOR codes rather than the codes themselves. The FOR codes are disciplinary by definition. With multi- and interdisciplinary research, you can simply use more codes to tag the same research. To support researchers across the country, a glossary, and shared understanding of the terms multi- and interdisciplinary research should be developed – and applied consistently across all Departments, funding bodies etc. The solution is less about the FOR-code review, rather a shared understanding of what these terms actually mean.*

*When research is transdisciplinary, ie it is not defined by an existing discipline, this could warrant a new code (this would be rare, but the review provides an opportunity to see if we are missing any new research disciplines or SEOs, eg neuroscience, AI, cybersecurity). However, the review does ask about frequency of amending the codes, this possibly provides somewhat of a solution to transdisciplinary research issues in that as research evolves a more frequent review could benefit emerging disciplines.*

**033 submission, for FOR 2102** by Prof. Andrea Witcomb and colleagues (Contact: Prof. Andrea Witcomb, Deakin)

- Interdisciplinarity and Multi-methodology

*The field includes theoretical and methodological approaches derived from architecture, archaeology, history, art history, material sciences (conservation), geography, sociology, anthropology not to mention the natural sciences, records management and interdisciplinary fields like digital humanities. Only some of these are recognised at the six digit level (materials conservation for example, probably because the practice occurs within museums and archival studies). The conservation of heritage buildings, however, is located in 120102, the management of parks in 1205 and the conservation and management of natural heritage in 0502. Library and Information studies (which, like record studies is within the GLAM sector) is in FOR 0708. In other words, there is no strong logic to the current separation of these fields.*

- **Interdisciplinarity and Multi-methodology**

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**034 Institute for Sustainable Futures at the University of Technology Sydney (Contact: Prof Stuart White Stuart.White@uts.edu.au)**

**Revising the Field of Research (FOR) codes to enable more integrative, inter and transdisciplinary science**

This submission<sup>1</sup> is from the Institute for Sustainable Futures at the University of Technology Sydney. For 21 years, ISF has been undertaking highly applied inter- and transdisciplinary research in close collaboration with government, industry and the community.

1 Our submission has been developed with reference to the submission from the Sustainable Development Solutions Network (SDSN).

For that reason, our submission particularly addresses the following question posed in the ANZRC Review 2019 Discussion Paper:

*10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

Properly addressing this question touches on all other questions in the discussion paper relating to the FoR codes.

The submission makes the following key recommendations:

- There needs to be a **separate track** – a second tier – for research that transgresses and transcends disciplinary boundaries and has strong stakeholder involvement. One way of describing this kind of research is ‘Integrative Science’.
- There is need for **further and more focussed consultation** with the Integrative Science community on the best way to structure this second tier. Our proposal is that it should be focused on the outcomes, rather than the inputs, and therefore that the SDGs

**Integrative, inter and transdisciplinary research for societal challenges**

Most of the biggest challenges facing humanity today, for example those encapsulated by the United Nations Sustainable Development Goals, are “wicked” problems that involve complex and interconnected human-natural systems, contain elements of uncertainty, and involve multiple actors, perspectives and values.

Scientific research has an essential role in supporting society to address these challenges.

Traditional disciplinary research has a very important role in understanding different components of these challenges and in helping to develop technologies to address them. However, newer integrative, inter and transdisciplinary research approaches are critical for understanding and managing the complexity of these challenges and developing solutions that will work in the real world (see references). While there is growing global attention to these types of research, they are generally poorly recognised and integrated within the Australian research systems.

**The problem with the current FOR code system**

The existing FOR codes enable disciplinary science by assigning research projects to specific academic disciplines for the purposes of peer review selection and evaluation. However, this

process impedes research that attempts to integrate across several disciplines by forcing the research into specific areas that do not capture the diversity of major goals, processes, and agendas of this approach to research. The current system disadvantages integrative, inter and transdisciplinary research assessment in two main ways:

- It leads to the assignment of proposal reviewers who are disciplinary experts rather than experts in the application of integrative, inter and transdisciplinary philosophies, theories and methods.
- Integrative, inter and transdisciplinary research is currently invisible for the purposes of ERA and institutional reporting. It is thus impossible to tell whether there is growth in the extent and quality of this important type of research, and it is less likely to receive specialised funding streams. This is particularly problematic with the growing focus on measuring and showcasing the societal impact of research, which these types of research approaches aim to increase. Critically, the impact of this is that the **current system not only hampers the career prospects** of those researching in these ways (Klein and Falk-Krzesinski 2017), but more significantly, it **holds back the scale and depth of change** that researchers are able to enable and enact in the wider world.

#### **Proposal for modifying the FOR code structure**

Like others, we propose a “two tier” process for FOR codes. Tier one is the existing disciplinary process. Tier two would be solely for a new science – that of integration and implementation – that brings together the many schools of thought around research activities whose intent is to gain ground on wicked problems, such transdisciplinary research or integrative science. For ease, and to align with other submissions, we use the term ‘integrative science’ in this document.

Integrative science (IS) would include approaches that:

- • Attempt true integration and synthesis across multiple disciplines and approaches to research
- • Study systems that span across multiple human and natural spheres, and the interactions and interdependencies between them
- • Do not fit into existing individual disciplinary FOR codes
- • Are flexible and evolving
- • Allow research that is co-defined and co-produced with stakeholders
- • Value, engage, and incorporate indigenous knowledge
- • Provide real mechanisms for co-learning and collaboration with partners experiencing the issues under study

ISF’s recommendation for the second tier differs from others<sup>1</sup>. We believe that breaking up the second tier along methodological lines, will only repeat and enlarge the challenges that are inherent in the original FoR codes for integrative and transdisciplinary sciences.

Instead, ISF suggests that the second tier should take a different approach – integrative scientists are specialists in areas of application – they are expert in seeing and engaging with **complex problems in context** from multiple perspectives, including many disciplines within the academy, alongside policy makers, decision makers, practitioners, and those impacted by others’ decisions. The UN Sustainable Development Goals (SDGs) are an exceptional framework that together identify essentially all the complex, wicked problems facing our planet. Every government in the world has signed up to achieving these by 2030, including Australia and New Zealand. These are the areas of expert insight that matter, so these ought to provide the framework for the second tier of the FoR process.

Bringing this topic focus into the FoRs does not duplicate the SEOs. The SEOs have a separate economic purpose. They provide a ‘what’ codification. In contrast, the SDGs provide a ‘why’.

Researchers choosing this second tier would still need to nominate the disciplines in the first tier from which they are drawing, at least at the two digit code level.

Reviewers for this second tier of IS research would be drawn from peers who identify as IS researchers, working in a particular complex problem space as per the SDGs, not from peers who identify as disciplinary specialists.

#### **Recommendation for next steps**

A centrally run process is needed to refine this proposal.

We therefore recommend approval by the ANZSRC Review parties of the general concept outlined above, followed by a series of workshops with IS researchers and the parties to work out the details.

Like others (eg NITRO and SDSN), we recommend a series of workshops engaging the ARC and leading integrative scientists to explore and come to a set of accommodations<sup>2</sup> around this proposal and a dynamic, evolving update of codes. Such a process could also define a mechanism for adding a code, using the principles already in place. It could explore and define a process for monitoring user experience – defining what kind of data to collect to assess the effectiveness and efficacy as well as the efficiency of the experience of using the code.

#### **042 College of Asia and the Pacific, Australian National University (Contact: none given)**

Question 10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

Recommendation 4: A separate consultation process should be established to identify the key issues and range of solutions that are available for managing inter- and multidisciplinary research.

The increasing importance of inter- and multidisciplinary research has been recognized through the ANZSRC classification scheme. The current management of inter- and multidisciplinary research nevertheless continues to be informed by the principle of mutual exclusivity. This can impede research that integrates knowledge across disciplines, including by leading to the assignment of disciplinary experts as reviewers who are rather than experts in the application of inter and multidisciplinary methods. The current treatment of inter- and multidisciplinary research also makes it difficult to understand whether there is growth in the extent and quality of this important type of research.

There are a number technical changes that could be considered in order to better manage the treatment of inter- and multidisciplinary research within the ANZSRC classification scheme, such as the designation of reviewers competent in reviewing funding proposals that identify as inter- and multidisciplinary research.

The complexity of treating inter- and multidisciplinary research appropriately within the ANZSRC classification scheme, without compromising the key principles of structure or mutual exclusivity, require a separate consultation process designed to identify the key issues and range of solutions that are available.

#### **047 Melbourne School of Engineering, University of Melbourne (Contact: Ivan Marusic)**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

Maintain the existing system whereby up to three 6-digit FoR codes can be selected (with weightings to indicate emphases) to describe research projects/work. This mechanism clearly allows interdisciplinary/multidisciplinary research to be signalled and promoted.

#### **055 University of New South Wales (Contact not given)**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

The discussion paper suggests that “interdisciplinary research must be either allocated to the most appropriate FoR or assigned across fields ... and that this can mean that interdisciplinarity of research may be lost”.

UNSW does not believe the current FoR structure leads to the loss of interdisciplinary coding. Rather than allocating a code to the ‘most appropriate FoR’, which can exclude key fields of research that might have contributed, the practice of multi-coding across fields of research to highlight interdisciplinarity should be encouraged. Based on accurate multi-coding, interdisciplinary research should be identifiable via additional analysis, giving greater levels of granularity to see which combinations of interdisciplinarity exist.

Multi-coding should be maintained until any new interdisciplinary field emerges as a discrete and established field of research, at which point a 4-digit, and later potentially even a 2-digit, code should be created. Decisions of when interdisciplinary research becomes its own field should be determined by a consistent, field-weighted/considered, volume-based set of criteria. Care should be given to what overarching code the new interdisciplinary code falls under as interdisciplinary codes can often be regarded as ‘muddled’ from disciplinary readers.

**056 Professor Jen Web University of Canberra personal**

How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

It does seem to me that the 1-digit clustering would effectively capture research conducted within a cluster. Granted it would not capture interdisciplinary research between clusters, but it is after all unlikely that ‘my’ findings directed toward, say, environmental writing (FoR19) would add real discipline-based knowledge to a collaborator in, say, environmental science (FoR05). In this scenario, the collaboration would enable the two partners to enrich their own understanding and deliver new knowledge within their own field, and that is a very fine outcome that need not be reported in other ways.

**057 Joint submission by CORE (Computing Research and Education), ACDICT, ACPHIS, ALIA, and NZ-PHIS (Contact not given)**

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**059 Elsevier (Contact 1: M’hamed el Aisati m.aisati@elsevier.com Contact 2: Steve Riddell s.riddell@elsevier.com)**

*10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

The concept of interdisciplinary/multidisciplinary research is dynamic: what was interdisciplinary research a few years ago, over time often evolves into a new discipline. Elsevier has been involved in *algorithmic evaluations* of interdisciplinary research in the past. The best way to capture interdisciplinary/multidisciplinary research can differ based on the purpose of the evaluation. One way of addressing this could be outside of the classification system, leaving articles assigned to their main subject area but indicating the mix of backgrounds that the work relies on. Another approach often used is by evaluating backgrounds of authors: bringing together researchers from different backgrounds. Yet another approach could be based on semantic diversity of the research

fingerprint of output. However, these approaches if relying on existing schemes, are sensitive to time, as well as consistent granularity of the fields: if a field has more diffuse subfields in a classification, work in that field will be more likely classified multidisciplinary compared to larger fields with broad subfields. All approaches have advantages and challenges to consider, and it would be our recommendation to carefully evaluate together with the community the objective for this capture, and work out a fitting solution based on the requirements.

**060 Australian Council of Engineering Deans** (Contact: Emeritus Professor Robin King, [robin.king@uts.edu.au](mailto:robin.king@uts.edu.au))

**FoR codes for interdisciplinary and multidisciplinary research:** most research in engineering (and as currently classified) is 'scientific' in nature although the research focus is very often inspired by human needs or from imagined futures. New Groups and Fields (such as Biomedical Engineering and Mechatronic Engineering) arise from new and combinations of knowledge, engineering and technologies. As discussed elsewhere, interdisciplinary and multidisciplinary research (e.g. between FoR Groups within and between Divisions) methods and focus are likely to be of increasing importance. For accurate coding of *Research Project* proposals and outcomes, we strongly recommend the continued practice of allowing coding to more than one Field.

**064 NITRO-Oceania (Contact: Gabriele Bammer)**

As the newly constituted peak body for inter- and trans- disciplinary research in the Oceania region, we welcome the research classification review, especially its willingness to consider the appropriate classification of multi-, inter- and trans- disciplinary research. We note the dearth of international exemplars to draw on and applaud the review's global leadership on this topic. We recognise the challenges involved in multi-, inter- and trans- disciplinary research and that it will take time for a fully workable system to evolve. We are keen to play a key role in further developments and suggest specific actions and collaborations below.

We address selected questions:

#### ***ANZSRC Principles***

***1. Are the principles of the Review outlined in Section 2 of the Discussion Paper appropriate and sufficient? Do any further overarching principles need to be considered in developing the revised ANZSRC?***

We applaud the guidance provided by a clear set of principles. We particularly note the principle of "Exhaustiveness," which is essential for an appropriate and fair consideration of multi-, inter- and trans- disciplinary research. We also note that proper consideration of multi-, inter- and trans-disciplinary research may require some rethinking of the principles of "mutual exclusivity" and "statistical feasibility." A high percentage of projects tackling complex societal and environmental problems involve a mix of discipline-based, multidisciplinary, interdisciplinary and transdisciplinary research and the mix of these elements may change over the course of the project. While this should fit within the current conceptions of "mutual exclusivity" and "statistical feasibility," further elaboration of multi-, inter- and trans- disciplinary research in light of these principles is warranted.

We recommend the addition of "Evidence-based" as a further principle. Given that multi-, inter- and trans- disciplinary research cover a wide range of research practices, the classificatory system must encompass that diversity effectively and to do so will first need to understand that diversity.

#### ***ANZSRC Classifications***

##### ***Type of Activity***

***2. What suggestions do you have to improve the ToA component of the classification?***

While we do not have specific suggestions for improvement, we note that multi-, inter- and trans-disciplinary research could occur in any of these four areas. A large research project on a complex global problem, which encompasses a mix of discipline-based, multidisciplinary, interdisciplinary and transdisciplinary research, could also encompass two or more of these types of activity.

### **Fields of Research**

#### **10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?**

There are a number of issues that require consideration. It is useful to start with three kinds of research relevant to this topic:

- research that studies and seeks to improve the practice of multi-, inter- and trans-disciplinarity
- research that fits neatly into a category of multidisciplinary or interdisciplinary or transdisciplinary
- research on a complex global problem that encompasses two or more elements of discipline-based, multidisciplinary, interdisciplinary and transdisciplinary investigation.

It is also useful to point out that multidisciplinary, interdisciplinary and transdisciplinary are used in two ways.

First, they are used generically to indicate research that brings together and acts on different strands of disciplinary and other knowledge (other knowledge includes perspectives of stakeholders and decision makers, and indigenous knowledge) to address a complex global problem.

Second, interdisciplinary and transdisciplinary are used specifically to refer to their respective established canons of scholarly work. For example, there is a specific way of approaching interdisciplinarity which is described in the *Oxford Handbook of Interdisciplinarity* and promulgated by the *Association for Interdisciplinary Studies* which publishes the journal *Issues in Interdisciplinary Studies* and runs an annual conference. The specific ways of approaching inter- and trans- disciplinarity do not just deal with complex global issues but can also be used to deal with straight-forward problems such as the cultural heritage of country music or building a mobile phone application to monitor a health condition.

Opening up consideration of multi-, inter- and trans- disciplinarity raises the question of whether other specific approaches with canons of scholarly work should also be included in reviewing FOR codes. These include systems thinking, action research, sustainability science, design science, implementation science and the science of team science.

We do not envisage that all these issues will be encompassed in the current review. We also note that there are divisions within the scholarly community about definitions and practices. For example, US researchers tend to see transdisciplinarity as developing an overarching synthesis framework, whereas European and Oceania-based researchers tend to see it as trans-sector participation of stakeholders in both research on complex problems, and implementation of solutions.

As the newly constituted peak body for inter- and trans- disciplinary research in the Oceania region, we see part of our mission as charting a path through the different understandings outlined above. The review's call to develop appropriate FOR codes is both a motivator for resolving these differences and a beneficiary of such resolution. We see this as requiring a decadal plan with biennial milestones and anticipate evolving adjustments to the FOR codes.

We would be pleased to work with the research classification review in:

- 1) developing a position paper that comprehensively covers the challenges we outline
- 2) establishing the decadal plan for resolving differences and refining appropriate FOR codes
- 3) hosting or co-hosting a series of workshops in Australia and New Zealand to collect evidence about the different ways multi-, inter- and trans- disciplinarity are practiced in our two countries in order to establish durable long-term changes in FOR codes
- 4) implementing the decadal plan.

We suggest that there are three topics that could be addressed and resolved by the current review, namely developing and assigning FOR codes for:

- a) research that studies and seeks to improve the practice of multi-, inter- and trans- disciplinary.
- b) interdisciplinary research that addresses a straight-forward problem by ‘borrowing’ and integrating tools and concepts from multiple, often disparate, fields of research into one research activity
- c) research that works closely with stakeholders (those affected by the problem under investigation) and decision makers (those in a position to do something about the problem under investigation), which we suggest should be referred to as ‘transdisciplinary.’

#### **Implementation**

##### **17. How would you (or your organisation) be affected if ANZSRC changes?**

As a network of leaders fostering inter- and trans- disciplinary research and education within and across organisations, we represent a range of research and education organisations in Australia and New Zealand (as well as the rest of Oceania) – see the list of signatories below. Our mission is inspiring and supporting researchers to achieve transformational impact on global challenges. The current lack of recognition of multi-, inter- and trans- disciplinary research in the research classification system is a significant barrier to the full development of these research activities and to the career prospects of those involved. More significantly it hampers the development of effective responses to urgent global challenges.

##### **19. How frequently should the ANZSRC be updated in the future? What advantages or disadvantages would there be if, in future, ANZSRC was updated dynamically and on an ongoing basis in response to stakeholder feedback?**

As outlined earlier, we would welcome dynamic updating as we recognise that it will take some time to evolve a fully workable system to classify multi-, inter- and trans- disciplinary research especially from the current “standing start”.

#### **066 University of the Sunshine Coast (Contact not given)**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

Nearly all research is multidisciplinary to some extent - pretty much all scientific and engineering research relies on math to some extent. A better understanding of priority might eliminate the need for multi-disciplinary codes. I have no problem assigning all research to one code only. Many papers that may touch on several discipline are significant for one discipline only. For instance a study on the impacts of climate change on ocean ecology may have a large interdisciplinary team, with input from oceanographers and atmospheric scientists. However the new knowledge developed in his study was primarily of interest to ecologists, so the paper was classified as ecology. Oceanographers or atmospheric scientists would not be interested in the paper (except as interesting to see their knowledge being applied to ecology) as there were no significant advances in oceanography or atmospheric sciences.

#### **067 Australasian Consortium of Humanities Research Centres (Contact: Professor Will Christie [william.christie@anu.edu.au](mailto:william.christie@anu.edu.au))**

##### **Inter/Multidisciplinarity**

We note the distinction between interdisciplinary and multidisciplinary research in the Discussion Paper and highly commend the Review in its efforts to better capture this kind of research. Given the problem it identifies – that “[f]eedback received by the Review agencies indicates that much current research is interdisciplinary or multidisciplinary in nature, and that this research can be difficult to classify within the ANZSRC”, in which “interdisciplinary research must either be allocated to the most appropriate FoR or assigned across fields” and consequently “information about the interdisciplinarity of research may be lost” (ANZSRC Discussion Paper, p.9, para 6) – the

ACHRC recommends the allocation of a new, high-level code for each, perhaps a new 2-digit code for both inter- and multi-disciplinary outputs, with two further sub-sections at 4-digit level to capture the different kinds of cross-disciplinary innovation and collaboration. We do not envisage that these codes would often be used as the sole or primary codes for individual research outputs, but their existence would allow researchers to flag cross-disciplinary work, thus providing stakeholders with better actual information about the sort of collaborations that are generating the most innovative results.

**069 Universities Australia** (Contact not given)

**MULTI AND INTERDISCIPLINARY RESEARCH**

UA agrees that the lack of capacity to identify multi and interdisciplinary research is an important problem to be addressed.

However, it is acknowledged that while there are options such as the ability to tag multi and interdisciplinary research, in practice it may be difficult to find a practical solution. The very nature of the Fields of Research hierarchy is to distinguish unambiguously between different fields of research, and identifying multi and interdisciplinary research is the antithesis of this.

Given the complex issues that the world is facing and the need for multi-disciplinary solutions, it is important that the review focuses on developing workable options for identifying multidisciplinary research and researchers. UA would be pleased to work with the review to achieve an outcome.

However, multi-coding across fields of research is a mechanism that does provide for analysis of multi-disciplinary and interdisciplinary research, and should therefore be encouraged in the interim.

**075 Mobo Gao**

What changes are required to the ANZSRC Fields of Research classifications, and why?

A FoR code should be allocated to interdisciplinary or multi-disciplinary research. Everyone seems to say that inter or multidisciplinary research is good and important but there is not mechanism to encourage this. Everyone is single disciplinarily trained and single disciplinary established not only in career, but also in institutions such as departments, journal publications

**077 Griffith University** (Contact: Research Policy, Office for Research)

**Interdisciplinary and Multidisciplinary Research**

Griffith has no clear view on how to incorporate interdisciplinary and multidisciplinary research into the classification and would be open to participating in further discussions and consultations that delineate specific needs and alternative solutions to better capture and understand interdisciplinary and multidisciplinary research in Australia and New Zealand.

There is a view that many of the obstacles associated with classification of multidisciplinary research lie in the interpretation of those using the classification systems, as much as in the classifications themselves. Considering it would be at least another ten years before reviewing this proposed classification, the creation of new categories to reflect contemporary issues is a risk, as it may turn out some of these to be relatively fleeting. Exceptions could be found in fields like FoR 09 Engineering and FoR 10 Technology in which interdisciplinary science is organically produced and could be adequately represented in the current classification by adding four-digit Groups (see specific comments below on FoR 10 Technology). The difficulties associated with the classification of interdisciplinary and multidisciplinary research are possibly best addressed through administrative means rather than by inventing new categories within the FoR classification. Modifying the classification or individual description of categories should always be compared with costs of losing continuity and comparability over time.

**081 Australian and New Zealand Association for Medieval and Early Modern Studies** (Contact [info@anzamems.org](mailto:info@anzamems.org))

- 1) The system discourages interdisciplinary research as FoR codes at 4- and 6-digit level assume a primary disciplinary. Medieval and Early Modern Studies demands interdisciplinarity, either in the form of methodological approach or in the form of collaborative scholarship, or both. Our members, although based in disciplines within the institutional structure of universities, produce scholarship that brings a range of approaches together, and which is frequently collaborative.

Recommendations for a revision to the existing FoRC structure:

The review Discussion Paper highlights a need to better classify interdisciplinary and multidisciplinary research. As noted above, our members frequently conduct such research, and their work might be considered inherently interdisciplinary.

An alternative option that would align with the principles of the review – specifically mutual exclusivity, exhaustiveness, and statistical feasibility that are particular pressure points for data collection and management on interdisciplinary research – would be to establish a Division that eschews the current disciplinary-based structure altogether. The ARC Engagement and Impact Assessment of 2018 provided a cue with the opt-in Unit of Assessment ‘Interdisciplinary’. This was for submissions that could not be captured by existing two-digit codes.

**088 Australasian Fluid Mechanics Society (Contact not given)**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

Maintain the existing system whereby up to three 6-digit FoR codes can be selected (with weightings to indicate emphases) to describe research projects/work. This mechanism clearly allows interdisciplinary/multidisciplinary research to be signalled and promoted.

**089 Sustainable Development Solutions Network (SDSN) Australia, New Zealand & Pacific** (Contact: Dr Tahl Kestin [tahl.kestin@monash.edu](mailto:tahl.kestin@monash.edu))

**Overview and key recommendations**

The Sustainable Development Solutions Network (SDSN) Australia, New Zealand and Pacific focusses on strengthening and accelerating action by the university sector towards achieving the United Nations Sustainable Development Goals (SDGs).

The SDGs reflect some of the biggest challenges facing humanity today. They involve exceedingly complex and interconnected human-natural systems, contain elements of uncertainty, and involve multiple actors, perspectives and values, all of which means resultant research is artificially constrained by old disciplinary boundaries.

For this reason, this submission, made by the Secretariat of SDSN Australia, New Zealand and Pacific, particularly addresses the following question posed in *ANZRC Review 2019 Discussion Paper*:

*10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

Properly addressing this question touches on all other questions in the discussion paper relating to the FoR codes.

The submission makes the following key recommendations:

- There needs to be a separate track for “Integrative Science”, which includes a 2-digit Integrative Science code.
- There is need for further and more focussed consultation with the Integrative Science community on the best way to structure this code and the sub-codes that come under it.
- Recognition for “Integrative Science” in Division 97, “Expanding Knowledge”, of the SEO codes.

### **The need for integrative, inter and transdisciplinary research**

The biggest challenges facing humanity today, such as those encapsulated by the United Nations Sustainable Development Goals (SDGs), involve exceedingly complex and interconnected human-natural systems, contain elements of uncertainty, and involve multiple actors, perspectives and values, all of which means resultant research is artificially constrained by old disciplinary boundaries.

Research that spans conventional academic boundaries has an essential role in supporting society to address these challenges. While traditional disciplinary research has a very important role in understanding different components of these challenges and in helping to develop technologies to address them, newer integrative, inter and transdisciplinary research approaches are critical for understanding and managing the complexity of these challenges and developing solutions that will work in the real world (see references).

Furthermore, such research brings multiple benefits to academia: It pushes disciplinary knowledge into new conversations and frontiers, stimulating innovative new knowledge such as that underpinning big data and the Fourth Industrial Revolution. It helps academia produce more impactful, socially relevant research by focusing academics on industry partners and communities and their problems. If academics do not have to translate and rework applied research into disciplinary boxes, they can more genuinely and productively engage with stakeholders. And finally, it better reflects the systemic nature of the world, leading to more accurate, higher quality insights and more effective applications.

Globally, attention is now firmly focused on these types of research. However Australia is lagging behind in recognising their growing significance and integrating them the Australian research system, which is consequently at risk of being rendered anachronistic and inhibitive of innovation.

### **The problem with the current FoR code system**

The existing FoR codes encourage disciplinary science by assigning research projects to specific academic disciplines for the purposes of peer review selection and evaluation. However, this process disguises and impedes research that attempts to integrate across several disciplines by forcing the research into specific areas that do not capture its value, uniqueness and diverse goals, processes, and agendas.

The current system disadvantages integrative, inter and transdisciplinary research in two main ways:

- It leads to the assignment of proposal reviewers who are disciplinary experts rather than experts in the application of integrative, inter and transdisciplinary methods, and who thus fail to comprehend the value of the research they are assessing.
- Integrative, inter and transdisciplinary research is currently invisible for the purposes of ERA and institutional reporting. It is thus impossible to tell whether there is growth in the extent and quality of this important type of research, and it is less likely to receive specialised funding streams. This is particularly problematic with the growing focus on measuring and showcasing the societal impact of research, which these types of research approaches are especially crucial for. By discouraging and rendering impactful research invisible, the outdated FoR framework disadvantages the whole Australian research system.

### **Proposal for an Integrative Science FoR track**

To address the problems with the current FoR code structure in relation to integrative, inter and transdisciplinary research, we propose a two-track process for FoR codes. Track 1 would be the existing disciplinary process. Track 2 would be a new “Integrative Science” process.

Integrative Science would include approaches that:

- Attempt true integration and synthesis across multiple disciplines and approaches to research
- Study systems that span across multiple human and natural spheres, and the interactions and interdependencies between them

- Do not fit into existing individual disciplinary FoR codes
- Are flexible and evolving
- Allow research that is co-produced with stakeholders.
- Incorporate indigenous knowledge

When entering FoR codes, researchers will be asked to choose one of these tracks. If they choose the Integrative Science track, they will have the option of either

1. Choosing from a limited number of pre-established Integrative Science fields, such as Sustainability Science, Innovation Studies, Ecological Economics, Development Studies (which is focussed on developing countries and communities), Ecological Design, Environmental Humanities, Systems Science, Translational Medicine, Human Ecology, Integrated Data Analytics, and Neurorobotics.
2. Choosing from a listing of the disciplinary FoR codes that are integrated in the specific research under the general heading of New Integrative Science.

Reviewers for Integrative Science research would be drawn from peers who identify as Integrative Science researchers, not from peers who identify as disciplinary specialists.

#### **Integrative Science in the SEO codes**

In a similar way to the FoR codes, the current structure of the Socio-Economic Objective (SEO) codes also significantly disadvantages integrative and interdisciplinary research. All the 6-digit options for Division 97, “Expanding Knowledge”, specify a single field (e.g., “Expanding Knowledge in the Mathematical Sciences”), forcing researchers back into disciplinary silos, and not providing recognition for research that integrate across areas of knowledge. There is therefore a need for “Integrative Science” to be given recognition through at least a 4 or 6 digit category in that division.

#### **Recommendation for next steps**

Because Integrative Science can touch on a very wide range of FoR disciplines, including directly on most 2-digit codes from 03 to 18, and a wide range of approaches, a centrally-run process to refine this proposal is needed. We therefore recommend approval by the ANZSRC Review parties of the general concept outlined above, followed by a series of workshops with Integrative Science researchers and the parties to work out the details.

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### **091 Science and Technology Australia (Contacts: Prof Emma Johnston and Kylie Walker)**

#### **Inter-disciplinary research**

Defining and categorising inter-disciplinary research continues to be a challenge for the research sector in Australia. For the majority of organisations that require the classification of research inter-disciplinary research is defined through the selection of multiple FOR codes and assigning a percentage score to each code which is covered by the research.

STA supports the use of multiple codes to identify inter-disciplinary research. The current technique is to apportion the fields of research in inter-disciplinary research through the use of percentages. This is a transparent and effective way of measuring inter-disciplinary research without adding extra impost on researchers. STA supports the current methodology for assessing and reporting inter-disciplinary research.

### **103 Robert Costanza**

Revising the Field of Research (FOR) codes to enable more integrative, inter and transdisciplinary science

Most of the biggest challenges facing humanity today are “wicked” problems that involve complex and interconnected human-natural systems, contain large elements of uncertainty, and involve multiple actors, perspectives and values. In today’s world, the emphasis in research, education, and policy therefore needs to shift from addressing problems in isolation to studying whole, complex, interconnected systems and the dynamic interactions between the parts.

Scientific research has an essential role in supporting society to address these challenges.

Traditional disciplinary research has a very important role in understanding different components of these challenges and in helping to develop technologies to address them. However, newer integrative, inter and transdisciplinary research approaches are critical for understanding and managing the complexity of these challenges and developing solutions that will work in the real world (see references). While there is growing global attention to these types of research, they are generally poorly recognised and integrated within the Australian research systems.

#### **The problem with the current FOR code system**

The existing FOR codes enable disciplinary science by assigning research projects to specific academic disciplines for the purposes of peer review selection and evaluation. However, this process impedes research that attempts to integrate across several disciplines by forcing the research into specific areas that do not capture the diversity of major goals, processes, and agendas of this approach to research.

The current system disadvantages integrative, inter and transdisciplinary research in two main ways:

- It leads to the assignment of proposal reviewers who are disciplinary experts rather than experts in the application of integrative, inter and transdisciplinary methods.
- Integrative, inter and transdisciplinary research is currently invisible for the purposes of ERA and institutional reporting. It is thus impossible to tell whether there is growth in the extent and quality of this important type of research, and it is less likely to receive specialised funding streams. This is particularly problematic with the growing focus on measuring and showcasing the societal impact of research, which these types of research approaches aim to increase.

#### **Proposal for modifying the FOR code structure**

Therefore we propose a “two track” process for FOR codes. Track one is the existing disciplinary process. Track two would be a new “integrative science” process.

Integrative science (IS) would include approaches that:

- Attempt true integration and synthesis across multiple disciplines and approaches to research
- Study systems that span across multiple human and natural spheres, and the interactions and interdependencies between them
- Do not fit into existing individual disciplinary FOR codes
- Are flexible and evolving
- Allow research that is co-produced with stakeholders.
- Incorporate indigenous knowledge

We recommend that the Integrative Science (IS) FOR codes allow for *either*

1. Choice from a limited number of pre-established IS fields, such as sustainability science, ecological economics, development studies, ecological design, environmental humanities, systems science, translational medicine, or human ecology
2. A listing of the disciplinary FOR codes that are integrated in the specific research under the general heading of New IS.

Reviewers for IS research would be drawn from peers who identify as IS researchers, not from peers who identify as disciplinary specialists.

#### **Recommendation for next steps**

Because Integrative Science can touch on a very wide range of disciplines, including directly on most 2-digit codes from 03 to 18, and a wide range of approaches, a centrally-run process to refine this proposal is needed. We therefore recommend approval by the ANZSRC Review parties of the general concept outlined above, followed by a series of workshops with IS researchers and the parties to work out the details.

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#### **105 Andy Pitman**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

I write with the specific issue of climate science, climate change, climate impacts, climate adaptation in mind. Each of these areas is genuinely interdisciplinary. I will use a specific example

- a research team trying to understand the future of Australia's climate. A typical team would all call themselves "climate scientist"- but the team could by necessity be built from applied mathematicians, Physicists, atmospheric scientist, oceanographer, computer scientists, ecologist, soil scientists and so on in the physical system and include biologists, chemists biological oceanographers and so on in the biophysical system. A team interested in working on how a community might adapt to climate change might include the above to predict the physical system, plus people working in risk, demography, vulnerability, behaviour science, law, engineering and so on. The FoR codes force any properly integrated team to be split. On an ARC Discovery or ARC Centre proposal, the limit to the number of FoR codes forces this split and the "known to be true" fear that spreading the choice of FoR codes risks a proposal being reviewed by communities that are less well known than one's core discipline encourages a narrow focus that is silo'd rather than a proper proposal that includes the appropriate pieces. Solutions ----- 1. Climate science should be an FoR code. It should not be within (say) 04 or 05 or 06 but should be a Division in its own right. I assume this is not going to be accepted. Therefore 2. Climate science should be added as an 0407. To argue the need for a Division: There should be a Division for Climate Science, Impacts, Adaptation, Mitigation Within this Division there should be sections on Climate Science - broken down by physical and biological systems Climate Impacts - on health, agriculture, water etc Climate Adaptation - build environment, business, technology, law, engineering etc Climate Mitigation - business, engineering, technology etc This matches the research actually undertaken and focusses research activities into the actual classifications that exist in the research community. It would enable interdisciplinary research by encouraging teams to confront the use of the science on societally important questions. If this review decides a Division would be useful I'd be perfectly happy to develop the whole case but I would want to know there was some viability for this suggestion before doing that. At the very minimum, climate science - a subset of the research in climate in general - should (and does) fit neatly into Division 04.

**107 Australian Academy of Technology and Engineering** (Contact: Ms Riajeet Kaur [riajeet.kaur@applied.org.au](mailto:riajeet.kaur@applied.org.au))

Emerging research areas are mostly interdisciplinary or multidisciplinary, such as environmental sustainability, quantum biology and biomimetics/bio-inspired technologies. Consideration should be given to making the classifications adaptable to this characteristic.

The Academy recommends that projects continue to be able to be coded to multiple FoR codes to allow the reflection of interdisciplinary and multidisciplinary research projects.

**113 Institute of Australian Geographers** (Contact: A/Professor Beverley Clarke)

*Question 10 a) How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

Geography is inherently interdisciplinary. As such, we are extremely interested in the idea of better reflecting interdisciplinary research in the FoR codes. The most obvious way to achieve such ends is simply to allocate percentages between codes (perhaps restricted to three codes)—and this would almost certainly work best at the Field (6 digit) level. We hope this option is examined.

**114 University of Wollongong** (Contact: Research Services Office or [research-services@uow.edu.au](mailto:research-services@uow.edu.au))

Capturing Multi and Interdisciplinary Research

There is currently little capacity for multi and interdisciplinary research to be properly captured under the ANZSRC. One workable solution to address this problem would be to replace all Group XX99 'Other' codes with a multi and interdisciplinary research code. Providing this option for each

Division 2-digit code would allow multi and interdisciplinary research to be more appropriately captured and classified according to the most dominant discipline.

**115 Swinburne University of Technology** (Contact: not given)

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

Application of multiple FoR codes to describe interdisciplinary/multidisciplinary research seems to be a better solution than structural changes to FoR codes. There might be a case for a supplementary classification that defines specific interdisciplinary/multidisciplinary terms with a cluster of FoR codes. However it is likely that these would evolve rapidly over time. We note that a number of current FoR elements already effectively describe interdisciplinary/multidisciplinary research areas eg Nanotechnology. In general these sorts of codes risk compromising the 'mutual exclusivity' principle.

**118 Macquarie University** (Contact not given)

10. HOW CAN THE FOR CODES BETTER CAPTURE INTERDISCIPLINARY/MULTIDISCIPLINARY RESEARCH, AND AT WHAT LEVEL (E.G. FIELD, GROUP, DIVISION)?

Macquarie notes that this information is already captured through using multiple FOR Codes in the coding of individual research objects. A new division is unlikely to solve this problem.

**130 editorial team of Women and Birth, the Journal of the Australian College of Midwives** (Contact not given)

6) How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

- a. A simple checkbox for each discipline, whether field, group or division would be helpful.

**138 Charles Sturt University** (Contact not given)

The current FoR codes can be problematic in trying to classify interdisciplinary research. It is also becoming increasingly difficult to identify some disciplinary research adequately (e.g., STEM education is one example). These factors need to be addressed within the review.

**139 Australasian Council of Deans of Arts, Social Sciences and Humanities** (Contact: [eo@dassh.edu.au](mailto:eo@dassh.edu.au))

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

Codes could be introduced as a two-digit Division to capture inter/multidisciplinary research, however some members considered revising entirely the basis for the taxonomy and working with data scientists to design new classification methods to be a better option.

**140 ANSTO** (Contact not given)

How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

The current practice of listing and weighting more than one FoR code when required for multidisciplinary research works well. Interdisciplinary and multidisciplinary research can usually be covered by three or four FoR codes. For example, work on micro-dosimeters covers areas across detectors, radiation physics to biological fields.

The 'miscellaneous' option is available if needed, but is open to interpretation. ANSTO suggests there could be an improvement to capture this type of research, which would be the introduction of a primary and secondary classification system to capture both the purpose and relevance of the work. This could be required at the group or even divisional level (for

example, research could easily encompass both chemical and physical sciences, and there is a dedicated field called “physical chemistry”).

**154 Council of Deans of Nutrition and Dietetics Australia and New Zealand (Contact: not given)**  
*10: How can the FoR codes better capture interdisciplinary / multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

To capture interdisciplinary or multidisciplinary research there is a need to change the system to examine specific problems rather than define research by the methodologies used. For example, in nutrition, in an example where researchers were trying to develop a model of care in stroke patients, researchers work with food technologists, medical researchers, statisticians, social scientists. This would involve food development in texture modified meals, clinicians (medicine and allied health) to examine clinical outcomes and social science researchers to examine quality of life related outcomes. The methods applied are quite different but capturing the research under “improved care models in health” would capture the discipline interactions. This does not fit under the current model.

Council of Deans do not advocate for this model at this point in time.

**157 International Australian Studies Association (InASA) (Contact: Executive)**

Interdisciplinary and Multidisciplinary Research:

The Discussion Paper raises the pressing issue that interdisciplinary research can be difficult to capture within current ANZSRC classifications since it has to be assigned across different Fields, and potentially across different Groups or Divisions. While there is not necessarily a hindrance in doing this, the feeling amongst many academics is that there can be a risk in crossing fields beyond the Field level when applying for ARC grants, particularly at Division level, since assessors attached to different FoRs do not necessarily understand the research protocols beyond their own field or the nature of interdisciplinary or multidisciplinary work. Essentially, while the ARC and universities encourage interdisciplinary or multidisciplinary research, when it comes time to assess such proposals, such researchers are potentially at a disadvantage.

At the moment, interdisciplinary or multidisciplinary research is best captured at the Group level by ‘Other’. But creating a dedicated interdisciplinary code at the Group level within each Division could better capture interdisciplinary work, and allow researchers to signal the interdisciplinary nature of their research in a more visible way. This option already exists for Gender Studies (169901 Gender Specific Studies) but needs to be available in other fields as well, such as Sexuality Studies or Transgender Studies. Furthermore, creating a dedicated interdisciplinary code at the Division level could potentially meet the needs of capturing ‘new and emerging research disciplines’.

New and Emerging Research Disciplines:

Australian Studies is an established multidisciplinary field rather than a ‘new and emerging’ discipline. It is reasonably well served in that it’s a field that can be captured across multiple existing FoRs. However, it would be more readily identifiable if new codes exist for identifying interdisciplinary and multidisciplinary research, as outlined above (e.g. Transgender Studies; Sexuality Studies).

**168 University of Technology Sydney (Contact not given)**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

This might be best achieved by a separate attribute. Once triggered UTS would support the use of the UN Sustainable Development Goals to capture the integrative science that is being conducted.

**175 Australian Historical Association (Contact not given)**

Interdisciplinary/Multidisciplinary

The system of listing a range of FoR codes is not necessarily a problem and this does, in history at least, genuinely reflect interdisciplinary activity. Most people working in Indigenous studies use multiple FoRs, with diminishing percentages, as this work is historical/ archaeological/ anthropological and importantly it is often comparative, that is, of multiple places. The aim is to see virtually nothing placed in the 'and other' category.

**177 TransTasman Midwifery Education Consortium (Contact not given)**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

Codes that focused on research subject areas rather than disciplinary groups would address this issue.

**178 Alison Rodger**

The detail and complexity of the coding system means the cross-discipline research and even single discipline research could be put in a number of places resulting in game playing being essential. In the era of collaborative research, which does not necessarily really fit the interdisciplinary or multidisciplinary guidelines, this is a distraction. My personal preference, based on experience elsewhere, is to reduce the level of complexity of the coding system, particularly for any assessment purposes.

**191 Australian Mathematical Sciences Institute (AMSI), the Australian Mathematical Society (AustMS) and the Statistical Society of Australia (SSA) (Contacts: Professor Tim Brown, Professor Jacqui Ramagge, Professor Adrian Barnett)**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

Interdisciplinary and multidisciplinary research need to remain as activities that can be classified under multiple FoR codes.

**206 Australian Council of Learned Academies (ACOLA) (Contact: Stephanie Chan, stephanie@acola.org.au)**

Interdisciplinary research provides the forum for ensuring that these issues are assessed in a holistic manner to ensure that we maximise benefits to society while also minimising risks. The classification of interdisciplinary research, however, has long proved problematic. Research that involves more than one discipline may cut across multiple classifications and therefore does not necessarily have one discernible classification within the current structures. This conflicts with one of the fundamental principles of any classification system – mutual exclusivity – where each unit of research should fit into one category of classification, and where categories should not overlap.

The current approach in the ANZSRC reflects this issue and is noted in the discussion paper – interdisciplinary research is allocated to the most appropriate Field of Research (FoR) or assigned across fields. Researchers are limited to classifying their research to either the broadest or most appropriate field. The identification of relevant research across disciplines is a necessary and critical aspect of interdisciplinary research. However, different terminology and classification codes across disciplines can present a potential risk that relevant research may not be readily discoverable.

In 2012, the Australian Research Council commissioned ACOLA to conduct a multivalent program of research into the question of interdisciplinary research in the area of sustainability. Phase one of this program, *Strengthening Interdisciplinary Research: What it is, what it does, how it does it and how it is supported*, identified ways of classifying interdisciplinary research. The report is enclosed in this submission for reference. The report provides six recommendations on supporting interdisciplinary research, including the importance of establishing a parsimonious classification system to allow the status of interdisciplinary research to be properly assessed (Recommendation 1).

The report recognises that such a system moves away from all-encompassing definitions and adds a level of complexity to the distinctions between multidisciplinary, interdisciplinary and transdisciplinary research. It further suggests that any development on a classification system must assess the considerations raised in the scholarship on interdisciplinary research theory alongside insights from interdisciplinary research in practice.

While the implementation of these recommendations are outside of the scope of the ANZSRC review, they may provide a useful framework to support the classification of interdisciplinary research.

Noting that this issue of classifying interdisciplinary research impacts on the wider research community, ACOLA would welcome the opportunity to expand on these points and provide further comment throughout the ANZSRC review.

Report attached: Bammer, G. 2012 *Strengthening Interdisciplinary Research: What it is, what it does, how it does it and how it is supported*. Report for the Australian Council of Learned Academies.

**211 Australian Association for Research in Education (Contact: [aare@aare.edu.au](mailto:aare@aare.edu.au))**

AARE is aware of debate around the need to capture multi-disciplinary and cross-disciplinary research. This is worth considering in the ToA context if possible. We do not recommend that it be considered in the Group or Division level as it would be less robust than the current solution of drawing on multiple FoRs.

**215 Queensland University of Technology (Contact: not given)**

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

FoR codes are predominately discipline-based, and therefore recording multidisciplinary research requires selecting appropriate FoR codes from different Groups for a project or research output and applying a percentage to each code.

It would be possible to combine codes to show research activity is multidisciplinary. For example, a Physics and Maths project might be combined at a Division level to 01-02 and this could be extended to Groups creating eight digit codes. This change requires adjustments in the framework to allow varied code lengths and re-conceptualising how R&D activity is reported.

At a 6-digit field level, some established multidisciplinary research areas are already captured, for example; 010202 *Biological Mathematics*, 160809 *Sociology of Education* and 140208 *Health Economics*. The framework currently only records them under one discipline, as required by the mutually exclusive objective. This is not particularly useful in identifying multidisciplinary research, as these multidisciplinary codes are not used consistently across the framework and the 6-digit Field level codes are often invisible in reporting.

**216 Australian Academy of the Humanities (Contact not given)**

Taxonomic classifications like the ANZSRC are not ready-made to accommodate cross-cutting research and make it especially difficult to track research that is **multidisciplinary and interdisciplinary** in nature. Multidisciplinary research is increasing in intensity across the humanities reflected in the use of multiple FoR codes used in research grant applications and apportioning of ERA outputs across multiple FoRs. There is also some provision within the existing codes for capturing this research, such as Asia-focused research via the 'catch-all' six-digit code [Studies of Asian Society – 169903], but again this research is not visible within ERA and the '16' code is in the social sciences.

**217 RMIT (Contact: Office of the Deputy Vice-Chancellor and Vice-President Research and Innovation, [dvcr@rmit.edu.au](mailto:dvcr@rmit.edu.au))**

*How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

RMIT prioritises and supports interdisciplinary research through virtual Enabling Capability Platforms, which bring together researchers from different disciplinary backgrounds to co-create research design and solutions to complex social, economic and environmental issues. How interdisciplinary research is reported both internally and externally is of pressing concern to RMIT.

RMIT takes the view that the interdisciplinary nature of contemporary research would be better reflected in how reporting is undertaken, rather than suggesting any changes to specific codes. At RMIT we store up to 3 FoR codes for a single publication or research project, enabling a more comprehensive description of the work. Whereas for public reporting often only one code is able to be selected, which hides interdisciplinarity and misrepresents the research (an example is Intelligent Transport research, involving disciplines across engineering, business and social sciences). RMIT recommends that up to three weighted FoR codes are recorded for reporting purposes. Additionally, to better capture interdisciplinary research, RMIT also recommends a thorough review of and limiting of exclusions and the introduction of new codes for emerging fields of research.

#### **NEW ZEALAND SUBMISSIONS**

**NZ002 Victoria University of Wellington (Contact: Professor Margaret Hyland, margaret.hyland@vuw.ac.nz)**

##### **Multi-disciplinary research**

VUW believes that capturing multi-disciplinary research more effectively within the existing FoR classification system is unnecessary. This is because it is already possible to apply multiple FoR codes when *using* the ANZSRC for classifying or reporting research. Universities, funding agencies, government departments etc who wish to better capture multi-disciplinary research simply need to design classification and reporting structures that allow for more than one FoR to be applied.

We content, furthermore, that the ANZSRC's principle of mutual exclusivity and the clearly stated definition of FoRs being based on *methodological approaches* means that multi-disciplinary research cannot be effectively categorised within the ANZSRC structure.

Where, however, a multi-disciplinary area of research has demonstrably reached both the threshold required for a new and emerging FoR designation *and* can be shown to be methodologically distinct from its component disciplines, a new classification is merited.

##### **NZ009 Auckland Regional Public Health Service (Contact not given)**

How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

In relation to question 10, we highlight the importance of the multidisciplinary/interdisciplinary nature of research and practice in public health. Many areas of public health involve collaboration between different professions and social entities, such as community organisations. Grant applications should facilitate and encourage the recognition of all parties involved in achieving research outcomes.

##### **Anonymous**

##### **Comments on Inter/multi/transdisciplinarity Australian and New Zealand Standard Research Classification Review 2019**

[Name and identifying details removed at submitter's request]

##### **ANZSRC Principles**

1. Are the principles of the Review outlined in Section 2 of the Discussion Paper appropriate and sufficient? Do any further overarching principles need to be considered in developing the revised ANZSRC?

The principle of "Exhaustiveness," which is essential for an appropriate and fair consideration of multi-, inter- and trans-disciplinary research.

Proper consideration of multi-, inter- and trans-disciplinary research may require some rethinking of the principles of "mutual exclusivity" and "statistical feasibility." A high percentage of projects tackling complex societal and environmental problems involve a mix of discipline-based, multidisciplinary, interdisciplinary and transdisciplinary research and the mix of these elements may change over the course of the project. While this should fit within the current conceptions of "mutual exclusivity" and "statistical feasibility," further elaboration of multi-, inter- and transdisciplinary research in light of these principles is warranted.

I recommend the addition of "Evidence-based" as a further principle. Given that multi-, inter- and trans-disciplinary research cover a wide range of research practices, the classificatory system must encompass that diversity effectively and to do so will first need to understand that diversity.

**ANZSRC Classifications**

*Fields of Research*

10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

There are a number of issues that require consideration. It is useful to start with three kinds of research relevant to this topic:

- research that studies and seeks to improve the practice of multi-, inter- and transdisciplinarity
- research that fits neatly into a category of multidisciplinary or interdisciplinary or transdisciplinary
- research on a complex global problem that encompasses two or more elements of discipline-based, multidisciplinary, interdisciplinary and transdisciplinary investigation.

It is also useful to point out that multidisciplinary, interdisciplinary and transdisciplinary are used in two ways.

First, they are used generically to indicate research that brings together and acts on different strands of disciplinary and other knowledge (other knowledge includes perspectives of stakeholders and decision-makers, and indigenous knowledge) to address a complex global problem.

Second, interdisciplinary and transdisciplinary are used specifically to refer to their respective established canons of scholarly work. For example, there is a specific way of approaching interdisciplinarity which is described in the *Oxford Handbook of Interdisciplinarity* and promulgated by the *Association for Interdisciplinary Studies* which publishes the journal *Issues in Interdisciplinary Studies* and runs an annual conference. The specific ways of approaching inter- and trans-disciplinarity do not just deal with complex global issues but can also be used to deal with straightforward problems such as the cultural heritage of country music or building a mobile phone application to monitor a health condition.

Opening up consideration of multi-, inter- and trans-disciplinarity raises the question of whether other specific approaches with canons of scholarly work should also be included in reviewing FOR codes. These include systems thinking, action research, sustainability science, design science, implementation science and the science of team science.

There are divisions within the scholarly community about definitions and practices. For example, US researchers tend to see transdisciplinarity as developing an overarching synthesis framework, whereas European and Oceania-based researchers tend to see it as trans-sector participation of stakeholders in both research on complex problems, and implementation of solutions.

NITRO-Oceania suggest that there are three topics that could be addressed and resolved by the current review, namely developing and assigning FOR codes for:

research that studies and seeks to improve the practice of multi-, inter-and transdisciplinarity  
interdisciplinary research that addresses a straight-forward problem by 'borrowing' and integrating tools and concepts from multiple, often disparate, fields of research into one research activity

research that works closely with stakeholders (those affected by the problem under investigation) and decision makers (those in a position to do something about the problem under investigation), which should be referred to as 'transdisciplinary.'

**NZ014 Fernanda da Silva Tatley**

How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?

A greater diversity of FORs is needed. There ought to be an option to combine specific FORs to create the relevant interdisciplinary research.