



**ERA EI Review
Final Report
2020–2021**

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Chair's Foreword

On behalf of the ERA EI Review Advisory Committee, I am pleased to present the *ERA EI Review Final Report* for consideration by the Australian Research Council (ARC) CEO. This report represents the culmination of a year's work by the Advisory Committee, taking into account a range of expert advice and consultation with stakeholders.

Excellence in Research for Australia (ERA) and Engagement and Impact (EI) are Australia's national assessments of university research performance. ERA is a well-respected and established measure of research excellence at the discipline level. EI was introduced in 2018 as a companion exercise to capture the non-academic benefits of university research for end-users. Together, the programs demonstrate the richness and diversity of Australia's university research landscape.



The recommendations of this report will make ERA and EI more robust and more useful to universities, government, industry and communities. For the first time, Aboriginal and Torres Strait Islander and other Indigenous research will be specifically evaluated in ERA. Improvements to the methodologies of both assessments will ensure they are well-respected in Australia and internationally into the future. More data will be published in open and dynamic forms to support the needs of universities, government and businesses. These changes will set the scene for a future where Australian university research is lauded not only for its world-leading quality, but also for its generation of results of outstanding value for end-users. All of this must be delivered while reducing the reporting burden for universities.

ERA and EI certainly provide valuable insights to governments, industry and the Australian university sector. Nevertheless, conducting our work through the 2020 COVID-19 pandemic gave us a valuable opportunity to reflect on the challenges faced by the university sector. Constrained budgets and reduced international enrolments have affected university resources and research workforces. In this context, it is more important than ever to minimise the reporting burden for universities. The Advisory Committee has identified opportunities to reduce the reporting burden, and we encourage the ARC to work with universities to take these up.

I would like to acknowledge the tremendous contributions over the past year of the Advisory Committee, ERA Assessment Methodology Working Group, Engagement Narrative Working Group and Indigenous Working Group. The ARC team provided outstanding support throughout the review for which we are very grateful. Finally, thanks go to those universities and members of the Australian research community who took the time to make submissions and engage with the review.

A handwritten signature in blue ink, appearing to read 'Michael Brooks', written in a cursive style.

Emeritus Professor Michael J. Brooks FTSE FACS
The University of Adelaide

Executive Summary

The Australian Research Council (ARC) is responsible for assessing the quality, engagement and impact of Australia's university research through its two assessment programs, Excellence in Research for Australia (ERA) and Engagement and Impact (EI). Together, the two programs have encouraged Australian universities to produce higher quality research and to strengthen their capacity for engagement and impact outside academia. However, the contexts of research assessment have changed since ERA was introduced in 2010, and technological developments offer the opportunity to streamline the programs.

To ensure the national research assessments address Australia's future needs, the ARC commenced a comprehensive review of ERA and EI in 2020. This report sets out the recommendations of the review Advisory Committee, a committee of distinguished academics, experienced research end-users, research evaluation experts and government representatives appointed by the ARC CEO. Membership and terms of reference can be found at Appendix A. The Advisory Committee met between 20 March 2020 and 8 April 2021 and considered how best to improve the value of ERA and EI to stakeholders across the university sector and the public, streamline the programs to reduce reporting burden for universities, and maintain best practice in research assessment.

In undertaking the review, the Advisory Committee was informed by extensive consultation. Due to COVID-19, it was necessary to conduct consultation activities virtually rather than face-to-face. Between 18 August and 12 October 2020, the ARC received 112 submissions from individuals and organisations in response to the public consultation paper. The Advisory Committee also considered issues raised by the Impact Study Research Project, in which the ARC commissioned advice on EI from experts from the University of Melbourne, the University of York, and King's College London. Finally, the Advisory Committee considered advice from targeted consultation with key stakeholder groups including ERA 2018 Research Evaluation Committee (REC) Chairs, Chairs of EI 2018 Assessment Panels and research end-users, and experts in Aboriginal and Torres Strait Islander research. A summary of the consultation process and full membership of the working groups can be found in Appendix B.

This report sets out a range of recommendations designed to enhance the value of ERA and EI. At present, the programs are most valuable for their capacity to promote improvements in university research and to produce uniquely detailed and robust information about Australian university research capabilities and strengths. This is reflected by updated objectives for each program and a unified vision statement articulating the purpose of the framework:

That rigorous and transparent research assessment informs and promotes Australian universities' pursuit of research that is excellent, engaged with community, industry and government, and delivers social, economic, environmental and cultural impact.

The proposed vision and associated objectives inform the subsequent recommendations, which aim to improve ERA and EI's capacity to inform and promote excellent, engaged and impactful research in a changing global research environment.

Australian universities produce excellent research by global standards. There are also outstanding examples of universities translating research into economic and societal benefits for Australia. However, global standards have evolved over the past decade and technological advances present new opportunities for ERA and EI.

These new contexts make it possible for ERA and EI to assess Australian research with greater robustness, transparency, inclusivity and utility for stakeholders. The report

recommends a number of significant changes, including the adoption of a by-line method as the primary criterion of research output eligibility, the refining of rating scales and quality benchmarks, and a potential increase in the number of impact studies to be submitted. It also details opportunities to improve the transparency, accessibility and usefulness of ERA and EI data, which is one of the most valuable by-products of the assessments.

The sector has highlighted the need for ERA and EI to recognise fully Indigenous research – a pillar of Australian research which, until now, has not been possible to assess as a discipline in its own right. The report advocates incorporation of Indigenous research into ERA and EI which would enable Australia's university research assessment system to represent research by and for all Australians.

Streamlining ERA and EI to reduce burden for universities was a key priority for the review. The report recommends taking advantage of developments in technology and data to automate as much of the submission process as possible – noting that some recommendations will take time to implement and some elements of the submission process will require manual entry and verification by universities. Nevertheless, by consolidating data across government and using external databases, reducing peak workload, and moving towards automation, there is the opportunity to significantly streamline the programs.

Finally, the Advisory Committee recommends taking steps to ensure that ERA and EI continue to reflect best practice in national research assessment. Although the Advisory Committee has found that the fundamentals of ERA and EI are strong, there are opportunities for continuous improvement. Sector feedback has consistently highlighted the need to refine ERA and EI methodology to ensure fairness and limit opportunities for gaming. In addition to refining definitions of key terms and guidance material for both programs, the report sets out recommendations to address sector concerns regarding perceptions of gaming and disparity in the results in ERA for different disciplines. Taken together, these recommendations will enhance the robustness, integrity and transparency of the assessment methodologies.

The recommendations in this report are designed to enhance the existing strengths of ERA and EI as a world class national research assessment system. Background material on the current methodology of these exercises can be found at Appendix C. To ensure that universities have time to adapt to the proposed changes, the Advisory Committee has recommended that implementation allows for further consultation with the sector where necessary.

List of Recommendations

Improving the value of research assessment for Australia

Recommendation 1: that the Australian Research Council (ARC) adopt the vision for Excellence in Research for Australia (ERA) and Engagement and Impact (EI):

That rigorous and transparent research assessment informs and promotes Australian universities' pursuit of research that is excellent, engaged with community, industry and government, and delivers social, economic, environmental and cultural impact.

Recommendation 2: that the ARC adopt new objectives for ERA:

Promoting Excellence: Rigorously assess research quality to promote pursuit of excellence across all fields and all types of research.

Informing Decisions: Provide a rich and robust source of information on university research excellence and activity to inform and support the needs of university, industry, government and community stakeholders.

Demonstrating Quality: Provide government and the public with evidence of the quality of research produced by Australia's universities.

Enabling Comparisons: Allow for comparisons between Australian universities and against world standard for all discipline areas.

Recommendation 3: that the ARC adopt new objectives for EI:

Promoting Engagement and Impact: Rigorously assess research engagement and impact to promote better practice engagement with, and translation of research into benefits for, end-users and the Australian community more broadly.

Informing Decisions: Provide a rich and robust source of information on the strategies, practices and benefits of university research engagement and impact to inform and support the needs of university, industry, community and government stakeholders.

Demonstrating Success: Provide evidence that Australia's universities are undertaking valued engagement with research end-users, embedding practices of engagement and impact, and producing research with social, economic, environmental and cultural benefits.

Enabling Comparisons: Noting the need for an appropriate calculation methodology, provide a basis for discipline-level comparisons between Australian universities of research engagement and impact performance.

Recommendation 4: that the ARC incorporate the newly-introduced Australian and New Zealand Standard Research Classification (ANZSRC) Field of Research (FoR) 45 Indigenous studies in ERA 2023 and EI 2024 using the same overall methodology applied to other disciplines, to be reviewed following the first assessments.

Recommendation 5: that the ARC works with universities on leadership in implementing the ANZSRC FoR 45 Indigenous studies in ERA 2023 and EI 2024.

Recommendation 6: that the ARC convene an expert working group to revise the ERA rating scale, the benchmarks for citation and peer review assessment, the definition and appropriateness of 'world standard' and the relevant guidance material for ERA assessors.

Recommendation 7: that the ARC work with EI stakeholders to develop a revised rating scale for EI that provides increased granularity, with descriptors that are informative to all

participants involved in the EI assessment process including assessors, universities, and researchers. End-users should be able to interpret easily the ratings and descriptors.

Recommendation 8: that beginning with EI 2024, universities be required to submit impact studies proportionate in number to Unit of Assessment size and/or capacity (perhaps with a maximum of 3-5 studies at the highest band). That the ARC work with universities to develop an equitable and appropriate calculation methodology for the number of required impact studies.

Recommendation 9: that the ARC work to improve access to ERA and EI data, including:

- a. Working with universities to publish as much ERA and EI data as possible, including publishing research output metadata with their apportionment to four-digit FoR, following an ERA round.
- b. Exploring potential improvements to the functionality of the ARC Data Portal and possible links with other Government datasets.

Recommendation 10: that the ARC work to promote greater insights from ERA and EI data, especially for government and end-user stakeholders, including investigating the potential of:

- a. Working with universities, industry and government to provide advice, advocacy and demonstrations on the value of ERA and EI data.
- b. Developing data products for a wider range of end-users for a variety of purposes, including outreach, reporting, advocacy and other innovative uses of this data.
- c. Enabling the reporting of interdisciplinary, multi-disciplinary and mission-based research.

Streamlining through smarter use of data and technology

Recommendation 11: that the ARC implement the following streamlining measures for ERA in consultation with universities:

- a. Adopting a 'collect once' approach to ERA, Higher Education Research Data Collection (HERDC) and Higher Education Staff Data Collection (HESDC) data, ensuring that ERA can re-use data from other collections.
- b. Harvesting data from existing data collections to partially pre-fill university submissions following ERA 2023, including investigating the feasibility of implementing automated FoR assignment to research outputs in future years.
- c. Strongly encouraging universities and researchers to include persistent digital identifiers such as Open Researcher and Contributor ID (ORCID) and Digital Object Identifier (DOI) in their data collections, to enable better data harvesting from a range of sources following ERA 2023.

Recommendation 12: that the ARC develop a by-line method in consultation with universities for determining research output eligibility, to be implemented post-ERA 2023.

Recommendation 13: that the ARC move to an annual data collection in ERA for use in post-2023 rounds, following the implementation of sufficient streamlining measures.

Recommendation 14: that ERA and EI continue to be run as separate programs, on three-yearly evaluation cycles, following the implementation of sufficient streamlining measures. That ERA and EI occur in consecutive calendar years.

Recommendation 15: that the ARC remove applied measures from ERA, prior to ERA 2023.

Recommendation 16: that engagement indicators for EI be determined by the institution, to enable universities to include metrics in narratives that demonstrate evidence of engagement as required on a discipline-specific basis.

Recommendation 17: that the co-supervision of Higher Degree by Research students with research end-users be developed into a mandatory engagement indicator for EI 2024, using data drawn from the Department of Education, Skills and Employment.

Recommendation 18: that quantitative impact indicators remain optional for the assessment of research impact, and that the ARC continue to investigate and monitor international progress in the development of possible impact indicators to identify any that may be applicable to the future assessment of impact in EI.

Maintaining best practice in national research assessment

Recommendation 19: that the dual methodologies of citation analysis and peer review continue in ERA, that disciplines continue to be assessed using the most appropriate methodology, and that ANZSRC 2020 FoR codes define Units of Evaluation in ERA and Units of Assessment in EI.

Recommendation 20: that further steps be taken to ensure the robustness of the peer review and citation methodologies used in ERA. In particular:

- a. Improve the application of the peer review methodology to ensure the appropriate application of 'world standard' (in consultation with the expert working group referred to in Recommendation 6), increase the size, quality and diversity of the peer reviewer pool, and improve training of peer reviewers.
- b. Provide Research Evaluation Committees with authority to exclude Units of Evaluation or research outputs where significant miscoding has occurred and request a recalculation of citation profiles.

Recommendation 21: that the ARC substantially retain the existing definitions for EI, with the following adjustments:

- a. That the definition of 'research end-user' for EI be expanded to include publicly funded research organisations, with guidance emphasising the nature of the impact or intent of the activity rather than the type of organisation.
- b. That the ARC develop additional guidance with examples to support the definitions of impact, engagement, and research end-user.
- c. That the ARC develop a definition of 'approach to impact.'

Recommendation 22: that the ARC continue to monitor international and best practice understandings of research excellence and investigate how they may be incorporated into future rounds of ERA and EI.

1 Improving the value of research assessment for Australia

Australian universities produce excellent research. From past rounds of ERA, evidence of exceptional research has been demonstrated across all disciplines. More recently, EI 2018 uncovered many success stories of universities' research reaching beyond academia to improve Australian lives.

As universities reposition for a post-COVID-19 future, the review offers a timely opportunity to enhance the value of ERA and EI to stakeholders across Australia. ERA and EI are already rich sources of information on the Australian university research landscape and successful strategies for improving engagement and impact. However, opportunities have been identified to enhance the programs and improve the reach and effectiveness of the insights they offer.

The Advisory Committee has reconsidered the mission, scope, and potential uses of ERA and EI in light of the needs of the Australian university research community, government, industry, and the Australian public. In addition to updating the vision and objectives of the programs, the review has identified three overarching strategies to enhance the value of ERA and EI. This chapter discusses recommendations designed to modernise ERA and EI, capture more granular and extensive information about Australian research, and make ERA and EI data more accessible and insightful for stakeholders across Australia.

1.1 A new vision of research assessment

The university research landscape, and the context of national university research assessment, have changed significantly since the ARC first developed ERA over 10 years ago. International ranking schemes have become much more prominent, and these compete with ERA for attention. There is a greater government and public focus on the impacts of research and how universities engage with industry, government, and community stakeholders, and this led to the inaugural EI round in 2018. In the global research community, there is also a growing awareness of the diversity of national research assessment programs – ranging from their contexts and policy objectives to the wider influences they exert on their respective research systems.

As companion exercises, ERA and EI assess different aspects of research performance and each has its own objectives. The review found that there was value in continuing the companion exercise approach, rather than combining ERA and EI into a single exercise. Assessing research quality, engagement and impact separately reflects the differences between each aspect of research – including the different types of evidence required for assessment – and produces more detailed insights into Australian research practices.

Nevertheless, ERA and EI form a holistic research assessment system, in which quality, engagement and impact all contribute to Australia's overall university research performance. Adopting an overarching vision statement would emphasise the common purpose uniting ERA and EI. The vision statement would also provide a clear indication of the strategic direction for the programs and set out why these programs are worth the investment from government and universities.

Recommendation 1: that the Australian Research Council (ARC) adopt the vision for Excellence in Research for Australia (ERA) and Engagement and Impact (EI):

That rigorous and transparent research assessment informs and promotes Australian universities' pursuit of research that is excellent, engaged with community, industry and government, and delivers social, economic, environmental and cultural impact.

In addition to the vision statement, a closer alignment in language between the two sets of objectives would reflect the intent of the system and reinforce the value of a holistic approach to research assessment. The Advisory Committee recommends updating the objectives of both programs to emphasise their established strengths and reflect the current context of research evaluation.

Although the ERA and EI programs have successfully promoted high-quality research, engagement and impact, they are not currently formal objectives of either program. Feedback from universities consistently indicates that ERA and EI have strongly influenced universities to focus on quality over quantity of publications, to implement best practices for research engagement and approach to impact, and to introduce new systems to track research impacts more effectively. As such, these key attributes should be recognised in the objectives of the programs.

In contrast, some objectives are no longer as relevant or viable as they were originally. For example, the ARC originally intended ERA to provide a stocktake of Australian research. As technologies have advanced and much more data is now available through citation providers, the value of ERA as a stocktake of research has declined. Because ERA still provides more detailed, subject-level data than other sources, the program is more valuable for the robustness and detail of its data than for its ability to provide a stocktake.

Similarly, ERA has not achieved its original objective to identify emerging research areas and opportunities for further development. ERA can and does identify research areas that are not performing well. However, its current methodology is not suited to distinguishing between low-performing areas and emerging areas – something that individual universities are better placed to understand. As changing the methodology to identify improvements over an ERA reference period would be burdensome for universities, the Advisory Committee advises that this objective should be retired.

As EI was developed more recently than ERA, its current objectives require less alteration. For the most part, the recommended changes focus on condensing and refining language to align with ERA and the overarching vision.

A new proposed objective is that EI should provide a basis for discipline-level comparisons between Australian universities.¹ Enabling comparisons would ensure that the program provides a sound basis for government to use EI outcomes in other contexts where information on comparative performance is required. Comparisons are also valuable to research end-users, for example when deciding between universities for a research partnership.

The Advisory Committee notes that EI is limited in its ability to provide discipline-level comparisons between universities. As such, this objective reflects a goal which must be supported by further work. It should be read in combination with Recommendation 8, Section 1.2.3, which proposes to strengthen the capacity of EI to support comparisons.

The proposed vision and objectives reflect the Advisory Committee's view of the value that ERA and EI can create for Australia.

Recommendation 2: that the ARC adopt new objectives for ERA:

Promoting Excellence: Rigorously assess research quality to promote pursuit of excellence across all fields and all types of research.

¹ As EI only captures Australian universities, international comparisons based on EI results are not a feature of the methodology.

Informing Decisions: Provide a rich and robust source of information on university research excellence and activity to inform and support the needs of university, industry, government and community stakeholders.

Demonstrating Quality: Provide government and the public with evidence of the quality of research produced by Australia's universities.

Enabling Comparisons: Allow for comparisons between Australian universities and against world standard for all discipline areas.

Recommendation 3: that the ARC adopt new objectives for EI:

Promoting Engagement and Impact: Rigorously assess research engagement and impact to promote better practice engagement with, and translation of research into benefits for, end-users and the Australian community more broadly.

Informing Decisions: Provide a rich and robust source of information on the strategies, practices and benefits of university research engagement and impact to inform and support the needs of university, industry, community and government stakeholders.

Demonstrating Success: Provide evidence that Australia's universities are undertaking valued engagement with research end-users, embedding practices of engagement and impact, and producing research with social, economic, environmental and cultural benefits.

Enabling Comparisons: Noting the need for an appropriate calculation methodology, provide a basis for discipline-level comparisons between Australian universities of research engagement and impact performance.

1.2 Improving our understanding of Australian university performance

ERA and EI provide a unique avenue to understand the performance of Australia's universities and the evolving landscape of Australia's university research. This information is used by universities, students, industry, government and other stakeholders for a variety of purposes, including strategic planning and policy development.

First and foremost, ERA and EI provide performance ratings for every discipline across Australian universities. As a by-product, ERA also produces detailed information on university staffing profiles, long-term trends in research, and the income universities receive to undertake research. This information enables additional analysis and reporting, such as the ARC's supplementary report *Gender and the Research Workforce* (ERA 2018).

The EI assessment provides rich examples of the strategies and practices universities have in place to engage with research end-users and translate their research into social, economic, environmental, and cultural impacts. It also highlights a wide range of research impact cases, which demonstrates the benefits of university research for Australia and the rest of the world.

The Advisory Committee has identified key areas where the capacity of ERA and EI to assess and communicate university performance could be enhanced. The following recommendations are designed to increase the rigour and comprehensiveness of ERA and EI to strengthen our understanding of the Australian research landscape.

1.2.1 Improved recognition and visibility of Indigenous research

In past rounds, ERA and EI were unable to fully evaluate Indigenous research due to the way Indigenous research has previously been classified. With the introduction of a new classification system, assessment of Indigenous research in ERA and EI is now possible. This would improve national recognition and visibility of Indigenous research and ensure that ERA and EI accurately reflect the Australian research landscape.

For ERA rounds from 2010 to 2018, the 2008 Australian and New Zealand Standard Research Classification (ANZSRC) Fields of Research (FoR) classification was used to define Units of Evaluation², or the disciplines to be evaluated in each university. ANZSRC was chosen due to the flexibility it allows in accounting for discipline-specific research behaviour. However, in the 2008 classification, Indigenous research was not represented as a high-level discipline in its own right.³ Instead, Indigenous research was captured at the most detailed level within broader disciplines such as health, languages and culture. Because ERA evaluates research at the higher levels of the classification, Indigenous research fell within the bounds of other disciplines and could not be evaluated as a distinct discipline.

For similar reasons, Indigenous studies was unable to be assessed fully in past rounds of EI. Because Units of Assessment in EI were designated using the same FoR codes, and ERA data was reused to inform the engagement assessment, it was not possible to assess Indigenous research without creating a significant additional burden for universities. When developing the 2017 EI pilot, the ARC consulted with Indigenous researchers to address this issue. Based on this consultation, the EI pilot and EI 2018 each included an additional assessment of research impact for Aboriginal and Torres Strait Islander research. However, this assessment was optional and could not cover engagement (due to lack of available data).

To improve representation of the scope and breadth of Indigenous research, the revised ANZSRC (2020) FoR introduced an Indigenous studies FoR (45) and subsets of FoR for Aboriginal and Torres Strait Islander, Māori and Pacific Peoples, and other Indigenous research. As a result, it is now possible to fully evaluate Indigenous research as a separate discipline in both ERA and EI. The structure of FoR 45 was the result of detailed consultation and co-design with Indigenous research experts in both Australia and New Zealand. The definition of Indigenous research used in ANZSRC builds on ARC consultation with Indigenous researchers through the pilot and inaugural round of EI.

Expert advice and Indigenous values are vital to the successful inclusion of Indigenous studies in ERA and EI. In addition to consultation with universities, the Advisory Committee benefited from the efforts of an Indigenous Working Group, comprising six respected Indigenous research leaders, which provided advice on key issues and unique considerations affecting Indigenous research. These issues included appropriate assessment methodology, incorporation of Indigenous values in assessment, and how best to support university leadership in implementing Indigenous studies in ERA 2023 and EI 2024.

² The term for a discipline or sub-discipline at a university is a 'Unit of Evaluation' in ERA and a 'Unit of Assessment' in EI.

³ ANZSRC FoR is structured in a hierarchy to represent disciplines and subfields. The two-digit FoR is the highest level, representing a broad discipline. It contains a collection of related four-digit FoRs, which represent specific discipline fields within the higher two-digit FoR. Each four-digit FoR contains a collection of related six-digit FoRs, which represent further specialisation within the discipline.

The review found strong support for incorporating Indigenous studies in ERA and EI as a separate discipline. Indigenous research stakeholders advised that peer review would be the most appropriate assessment methodology in ERA. Indigenous stakeholders also advised that the ARC would need to support universities to encourage leadership in implementing the new Indigenous studies FoR.

Together, these recommendations would improve the visibility of Indigenous research in Australia and improve the ability of ERA and EI to recognise the full extent of Australian research.

Recommendation 4: that the ARC incorporate the newly-introduced Australian and New Zealand Standard Research Classification (ANZSRC) Field of Research (FoR) 45 Indigenous studies in ERA 2023 and EI 2024 using the same overall methodology applied to other disciplines, to be reviewed following the first assessments.

Recommendation 5: that the ARC works with universities on leadership in implementing the ANZSRC FoR 45 Indigenous studies in ERA 2023 and EI 2024.

1.2.2 More granular ratings and improved benchmarking

Over the past decade, the quality of Australian research and the global contexts of national research assessment have changed. Although the rating scales and benchmarks used for ERA and EI were fit for purpose at the time of their respective developments, improvements are now necessary to keep pace with evolving contexts. Introducing more granular ratings and improved benchmarking would ensure that ERA and EI continue to deliver robust and relevant information about Australian university research performance.

At present, ERA evaluates research quality using a five-tier rating scale. In both citation and peer review disciplines, expert reviewers assess research quality by comparison to the world standard for that discipline. The top rating of 5 indicates that a discipline at a given university demonstrates outstanding performance, well above world standard. A rating of 3 indicates performance at world standard, and a rating of 1 indicates performance well below world standard. This rating scale is broadly consistent with the approach taken in research evaluation processes in other countries and is well suited to represent a broad spectrum of performance ranging from low to high.

However, Australian university research quality has improved rapidly in the decade since the introduction of ERA. In ERA 2018, 90 per cent of university research achieved a rating of 3 or higher, indicating that most university research now performs at or above world standard. ERA is not the only indicator of improvement in Australian university research quality. Other measures of research quality, such as Australia's performance in international rankings, also show significant improvement in Australia's university research over recent years.⁴ Based on analysis conducted by the ARC for the review, Australian research consistently exceeds global performance, attracting more citations and including more papers in the top one per cent of the world. In 2018, Australia ranked eighth out of 36 Organisation for Economic Co-operation and Development (OECD) nations for highly cited publications relative to population.⁵

⁴ For example, results in the Times Higher Education World University Rankings show that the number of Australian universities in the top 200 has increased from seven in 2010 to 11 in the 2020 rankings. In addition, based on Clarivate's [Highly Cited Researchers list](#), the number of highly cited researchers coming from Australia has tripled in the past six years from 80 researchers in 2014 to 305 researchers in 2020—the fifth highest national ranking globally.

⁵ Innovation and Science Australia, [Performance Review of the Australian Innovation, Science and Research System](#), 2016.

While Australian research excellence is genuinely improving, in recent years there has been a rapid increase in the number of publications generated worldwide. Many of these publications are uncited, or attract few citations, resulting in a widening gap between Australian performance and the world standard. If the improvement in Australian research quality continues to diverge from the world standard, there is a risk that the ERA rating scale will become less capable of differentiating between high performers as university ratings cluster at the top of the scale.

The Advisory Committee considered this issue alongside the concern that the world standard benchmark in ERA is not well-defined and may not be applied consistently between citation analysis and peer review disciplines. While the challenges are clear, the complexity of ERA benchmarking means that further technical work is required to reach a robust and equitable solution.

The Advisory Committee recommends convening an expert working group to consider the technical aspects of revising the ERA rating scale, benchmarks, and the definition and appropriateness of world standard, to be completed for ERA 2023. This working group would have scope to consider methodological and disciplinary-specific needs, such as equity between humanities and social sciences (HASS) disciplines and science, technology, engineering and mathematics (STEM) disciplines. It should also include Indigenous stakeholders to consider Indigenous research quality standards. This would ensure that ERA continues to recognise fairly and promote the pursuit of higher quality research beyond the standards already achieved.

Similarly, for EI, the Advisory Committee concluded that the three-tiered rating scale (Low, Medium and High) currently used for engagement, impact, and approach to impact is not sufficient to discriminate between degrees of university performance at either end of the scale. Under the current rating scale, a university discipline with no engagement or impact mechanisms in place would receive the same rating as a discipline where mechanisms are low but present. Universities also reported that the ratings they received were not informative enough to learn how to improve their results.

Refining the rating scale for EI would allow a more accurate and detailed assessment of research engagement and impact in Australian universities. A rating scale with four or five tiers might allow EI to recognise outstanding performance, as well as to distinguish between degrees of performance at the low end of the scale. The Advisory Committee recommends conducting further work to ensure that the new rating scale is suitable and accessible to EI stakeholders, to be completed for EI 2024.

Recommendation 6: that the ARC convene an expert working group to revise the ERA rating scale, the benchmarks for citation and peer review assessment, the definition and appropriateness of ‘world standard’ and the relevant guidance material for ERA assessors.

Recommendation 7: that the ARC work with EI stakeholders to develop a revised rating scale for EI that provides increased granularity, with descriptors that are informative to all participants involved in the EI assessment process including assessors, universities, and researchers. End-users should be able to interpret easily the ratings and descriptors.

1.2.3 Improving the capture of the impacts of research across the sector

EI provides a rich source of qualitative information on effective strategies for engagement and impact beyond academia; however, the program’s capacity to capture a variety of research impacts across the sector and support discipline-level comparisons could be improved.

EI impact studies are a valuable source of information on the societal benefits that accrue from university research. However, EI submissions currently only include a single impact study per eligible discipline at a university, called the Unit of Assessment. Consequently, EI only captures a small sample of impacts from Australian university research. Because a single impact study does not account for the depth or volume of impactful research activity in a discipline, the program's capacity to support discipline-level comparisons between institutions is currently limited.

As discussed in Section 1.1, the ability to draw comparisons between universities is valuable to research end-users, who may wish to use EI to inform research partnership decisions. Improving the comparative ability and robustness of the program would also ensure that EI provides a sound basis for future governmental initiatives where information on comparative performance is required.

Scaling the number of impact studies proportionate to Unit of Assessment size would enhance the comparative ability and robustness of the program. For example, EI assessors would be able to distinguish between universities with a diverse range of excellent impacts in a large discipline and universities with only one. Consequently, universities would be able to showcase a greater variety of beneficial impacts in larger disciplines. It would also produce richer qualitative information on research impacts in larger Units of Assessment and allow universities to demonstrate more instances in which their strategies to encourage impact have been effective.

To balance robustness against reporting burden, the Advisory Committee recommends that universities be required to submit impact studies proportionate in number to Unit of Assessment size and capacity, from EI 2024 onwards. Units of Assessment with multiple impact studies would still receive a single rating, recognising that large research areas should be expected to have more impacts to describe than smaller areas. This would be a modest increase only – maximum 3–5 studies at the highest band – and would be based on an equitable calculation methodology to be developed in consultation with universities.

Recommendation 8: that beginning with EI 2024, universities be required to submit impact studies proportionate in number to Unit of Assessment size and/or capacity (perhaps with a maximum of 3-5 studies at the highest band). That the ARC work with universities to develop an equitable and appropriate calculation methodology for the number of required impact studies.

1.3 Responding to stakeholder needs through more open and dynamic data

ERA and EI produce a significant amount of unique data on Australia's university research landscape. This data is used by a variety of stakeholders including universities, government and industry. However, the review found that stakeholders face challenges in making full use of ERA and EI data. The Advisory Committee recommends making improvements to how the ARC analyses and reports on ERA and EI data to increase its transparency, accessibility and capacity to support reporting on multi-disciplinary or mission-based research.

Transparency is a high priority for ERA stakeholders, especially those in the university sector. Although the ARC must withhold some information gathered during assessment to protect privacy or commercial confidentiality, publishing as much ERA and EI data as possible would help to assure universities that ERA is rigorous and fair.

To increase the transparency of the programs, the Advisory Committee recommends publishing the metadata for all research outputs submitted to ERA with their apportionment to four-digit FoR codes following an ERA round. As a consequence, there would be publicly available information of the volume of research outputs for each Unit of Evaluation. A

longstanding concern in the sector has been that two institutions can receive an identical ERA rating for a given FoR discipline with no information provided in regard to volume of activity, which may vary markedly. As a measure that would also address sector concerns about gaming. This recommendation and others are also discussed in section 3.2.1.

The review found that ERA and EI data can and does assist a range of stakeholders for a variety of purposes. As the only data set that provides a holistic picture of the Australian research sector at a fine-grained level by field of research and institution, stakeholders in government and academia use ERA to inform their policy understanding.

For stakeholders external to academia, the review identified some challenges in using ERA and EI data, especially around awareness, accessibility, and ease of analysis. Performance ratings alone do not convey the full range of information required by industry partners looking for university collaborators, and the current ARC Data Portal requires additional manual data collation and manipulation to be meaningful for the purposes of external users.

Finally, the disciplinary underpinnings of ERA and EI are not easily applicable to multi-disciplinary or mission-based research within industry and elsewhere. Under current ERA and EI methodology, interdisciplinary research can be assigned to up to three specific disciplines with a percentage apportioned to each. For example, some COVID-19 research might be classified in the ANZSRC codes for 3201 Cardiovascular medicine and haematology, 4206 Public health and 3107 Microbiology. The research is then evaluated in its separate discipline components. Because mission-based research often falls across multiple disciplines, it can be challenging to separate it out for reporting.

Currently, ERA assesses multi-disciplinary research by providing assessors with interdisciplinary profiles detailing the extent to which research outputs in their field have also been assigned to other disciplines. Assessors may also collaborate with assessors from other disciplines to evaluate multidisciplinary work. This helps to ensure that interdisciplinary work is assessed fairly and appropriately in ERA. Because ERA is a disciplinary assessment, however, it does not address the challenge of reporting on interdisciplinary or mission-based research.

With the continuous improvement of text-based mining and artificial intelligence-based technologies, it will become increasingly possible to uncover and report on interdisciplinary and mission-based Australian research. At present, it is possible to search the ERA system for a specific keyword such as 'COVID-19', which will identify all research publications that include the keyword in the title. This will produce reliable reports on the type and volume of research produced on a specific topic during an ERA period. It can also provide a starting point from which the ARC can further develop its ability to report on priority research areas through more sophisticated techniques.

Recommendation 9: that the ARC work to improve access to ERA and EI data, including:

- a. Working with universities to publish as much ERA and EI data as possible, including publishing research output metadata with their apportionment to four-digit FoR, following an ERA round.
- b. Exploring potential improvements to the functionality of the ARC Data Portal and possible links with other Government datasets.

Recommendation 10: that the ARC work to promote greater insights from ERA and EI data, especially for government and end-user stakeholders, including investigating the potential of:

- a. Working with universities, industry and government to provide advice, advocacy and demonstrations on the value of ERA and EI data.

- b. Developing data products for a wider range of end-users for a variety of purposes, including outreach, reporting, advocacy and other innovative uses of this data.
- c. Enabling the reporting of interdisciplinary, multi-disciplinary and mission-based research.

2 Streamlining through smarter use of data and technology

A major priority of the review was to investigate ways in which the programs can be streamlined. Universities provided consistent feedback that the reporting burden of ERA and EI is too great. The Advisory Committee considered several measures to streamline reporting while maintaining the robustness of ERA and EI.

This chapter details recommended streamlining measures. Some of these measures could be implemented for ERA 2023. Others would require additional time for implementation and would be used for later ERA rounds.

2.1 Harnessing data and technology to reduce reporting burden

One major strategy for reducing the reporting burden for ERA and EI would be to make more efficient use of external data collections and technological advances in machine learning and automation. Recent advances in the sophistication and extent of research data collections mean that much more data is readily accessible to the ARC than was the case when ERA began in 2010.

The Advisory Committee considered potential uses of other data sources, particularly Department of Education, Skills and Employment (DESE) data collections and online research databases.

The Advisory Committee examined several measures that could leverage these other data collections and technologies to streamline ERA. Taken together, these measures would allow the ARC to pre-fill portions of universities' submissions based on existing data. Better linkages with DESE data collections would also reduce the burden on universities to report similar data to both DESE and the ARC. Some measures, such as a by-line approach to determine research output eligibility, would also improve the integrity of ERA evaluations while delivering on the key purpose of streamlining the program.

Due to the technical challenges of implementation, these improvements would require a period of phasing in, with some benefits realised for ERA 2023 and increasing benefits expected in subsequent rounds. Some technologies (for example automated assignment of FoR codes) are not yet mature enough for full deployment. For the foreseeable future, pre-filled submissions are still likely to require some manual verification to address errors or gaps in the capability of automated processes, but this would still represent a reduction in workload compared to fully manual submissions.

2.1.1 Using existing data collections

Reducing the amount of data that universities need to collate for ERA submissions was a key priority for the review. In ERA rounds up to 2018, universities were required to submit all relevant data in a specified format, directly to the ARC. However, similar data collections exist which could be re-used for ERA evaluations to reduce the reporting burden on universities.

Universities report a significant volume of data to both the ARC and other government departments, which could be streamlined to reduce duplication of effort. DESE administers the Higher Education Research Data Collection (HERDC) and the Higher Education Staff Data Collection (HESDC). HERDC collects information on university research funding very similar to that collected for ERA evaluations. HESDC collects information on university staffing.

While these collections are not currently directly compatible with ERA due to different reporting timeframes and specifications, relatively minor changes to ERA requirements and DESE collection specifications would allow DESE data to be re-used directly in ERA and eliminate double reporting. This is a 'collect once' approach which would reduce the reporting burden for universities across government.

In the private sector, research citation databases are becoming ever more sophisticated. In coming years, it is likely to be feasible to partially pre-populate research output data for ERA submissions based on data already held in these databases. Although some outputs are not well-captured by research citation databases, such as non-traditional research outputs and conference publications, the databases capture a significant majority of all research outputs (especially journal articles).⁶ In the short to medium term some manual reporting and verification by universities would still be necessary. However, partial pre-population of submissions would reduce the reporting and data entry workload for universities, especially when combined with annual reporting (see section 2.2.1).

Following ERA 2023, it may be possible to pre-populate submissions with research output FoR assignments using machine learning methods. This technology is not likely to be accurate enough to use in ERA 2023, but research data providers' capabilities in auto-classification of research outputs are rapidly improving. In the future, the benefits of AI-assisted FoR assignment could be delivered either by the ARC applying it directly to university data as part of the ERA submission process, or by third party data providers offering automatic FoR assignment services to university subscribers. Further work in this area is required.

In recent years, the ORCID iD has been gaining prominence as a global unique identifier for researchers. ORCID iDs allow interoperability between data collections (for example, if a researcher recorded an ORCID iD in HESDC then it would be possible to link that data with research output data stored in a research citation database). ERA has trialled collection of ORCID iDs in previous rounds. Higher rates of reporting on ORCID iDs in ERA submissions (whether directly or through external data sources) would allow the ARC to gather data more effectively and pre-populate ERA submissions without university involvement.

Recommendation 11: that the ARC implement the following streamlining measures for ERA in consultation with universities:

- a. Adopting a 'collect once' approach to ERA, Higher Education Research Data Collection (HERDC) and Higher Education Staff Data Collection (HESDC) data, ensuring that ERA can re-use data from other collections.
- b. Harvesting data from existing data collections to partially pre-fill university submissions following ERA 2023, including investigating the feasibility of implementing automated FoR assignment to research outputs in future years.
- c. Strongly encouraging universities and researchers to include persistent digital identifiers such as Open Researcher and Contributor ID (ORCID) and Digital Object Identifier (DOI) in their data collections, to enable better data harvesting from a range of sources following ERA 2023.

2.1.2 Streamlining the eligibility requirements for research publications

Changing the method used in ERA to determine research output eligibility would reduce the reporting burden for universities and improve the integrity of the evaluation. ERA rounds up to 2018 have used a 'census date' method to determine the eligibility of researchers and

⁶ In ERA 2018, 64 per cent of all submitted outputs were journal articles indexed by that round's citation data provider. The actual proportion of pre-fillable outputs would be higher due to improvements in data providers' journal coverage since 2018, and partial coverage of books and conference papers.

their outputs. Under this method, a researcher's outputs are eligible to be included in a university's ERA submission if the researcher was employed by the university on a specified date at the end of an ERA reference period. For most types of researchers, a research output did not need to be produced at the submitting university and therefore did not need a university by-line to be eligible for inclusion.⁷

Universities reported that the census date method results in some undesirable outcomes and presents opportunities for manipulating the ERA process. For example, it is possible for a university to hire a high-performing researcher shortly before the census date and benefit from six years' worth of high-quality research outputs that were produced when the researcher was at a different university. Consequently, determining eligibility based on the university by-line attached to a research output is commonly seen as a fairer way of recognising the university (or universities, in cases where researchers list multiple affiliations) which supported its production.

The Advisory Committee agreed with stakeholders that using a by-line to determine research output eligibility would improve the robustness of ERA but noted some complexities that could arise. Appropriate arrangements would need to be agreed for research outputs such as non-traditional research outputs that do not typically include by-lines. In implementation, the ARC would also need to frame eligibility criteria carefully to ensure the changes avoid unintended consequences.

It would take time to work through these issues, and universities must also be given time to adapt to this change. As a result, the Advisory Committee considered that the census date method should still be used for ERA 2023 while a by-line approach is developed for future rounds. Furthermore, the ARC should establish an expert working group to develop appropriate guidelines to implement the by-line eligibility method.

Recommendation 12: that the ARC develop a by-line method in consultation with universities for determining research output eligibility, to be implemented post-ERA 2023.

2.2 Reducing peak workload

Another way of reducing the reporting burden for universities would be to manage the peak workload required for ERA and EI. In addition to concerns about overall workload, universities have observed that the ERA and EI reporting workload is not balanced over a cycle. Large peaks in activity during infrequent reporting and assessment years can create problems for balancing workloads for administrative staff. This was exacerbated in the 2018 round, where ERA and EI were undertaken concurrently. At most universities, the same staff worked on both submissions. The Advisory Committee considered possible modifications to ERA and EI to spread the workload more evenly across a reporting cycle.

2.2.1 Annual Collection

The administrative burden for universities in an ERA reporting cycle is currently concentrated in the submission period. An annual collection of ERA research data would distribute this burden more evenly. Smaller and more regular collections would allow universities to balance staffing workloads. It would also increase engagement between the ARC and universities across a reporting cycle, and may provide opportunities to identify issues and improve processes outside the peak period of ERA assessment years.

⁷ ERA uses different eligibility criteria for researchers based on their type of employment with a university.

Previously, one challenge impeding annual collection of ERA data was related to the census date criteria for staff eligibility. As staff joined and left universities, the eligibility of their research outputs would change, resulting in a significant need to revise and update data across a reporting cycle. The move to a by-line-based criterion for research output eligibility (see Recommendation 12) would make annual data collection simpler to manage. It would also be important to implement streamlining measures in ERA and DESE data collections, to ensure annual reporting does not place unnecessary burden on universities.

Most of the reference period for ERA 2023 has already elapsed, so it would not be feasible to implement this recommendation for ERA 2023. The Advisory Committee recommended the ARC work with universities to discuss timing for commencement of annual data collection and transition measures, with a view to using annually collected data for the subsequent ERA round.

Recommendation 13: that the ARC move to an annual data collection in ERA for use in post-2023 rounds, following the implementation of sufficient streamlining measures.

2.2.2 Frequency and timing of ERA and EI rounds

The frequency and timing of ERA and EI has a significant effect on the reporting burden for universities. Consultation feedback indicated that the reporting burden under the current methodology is significant. This was particularly true in 2018, when the inaugural EI round was run concurrently with an ERA round.

However, stakeholders were divided on whether a longer cycle would be more appropriate given the purpose and uses of ERA and EI. Reducing the frequency of ERA and EI would reduce the timeliness of data. For example, with a five-yearly ERA cycle, by the time a set of ERA results is published the results of the previous round would be based on research outputs that are between six and twelve years old. While older research remains valuable, especially in disciplines such as the humanities, there are significant benefits in having ERA provide a timely report on Australian university performance.

The Advisory Committee considered that with effective implementation of the streamlining measures described elsewhere in this report, a three-yearly cycle is likely to be sustainable for universities and more valuable for stakeholders. As the measures are implemented, the ARC should continue to consult with universities about how well streamlining benefits are being realised. If the measures are successful, ERA and EI should run on a regular three-year cycle to balance workload with currency of data.

There was consistent feedback from stakeholders that ERA and EI should not be run in the same year again. However, EI benefits from the ability to re-use ERA data (such as using the ERA output counts as a basis for determining if a university should make a relevant submission in EI). The Advisory Committee considered that running the two assessments in consecutive calendar years would balance these factors.

Recommendation 14: that ERA and EI continue to be run as separate programs, on three-yearly evaluation cycles, following the implementation of sufficient streamlining measures. That ERA and EI occur in consecutive calendar years.

2.3 Removing unnecessary data

As a further way to reduce reporting burden and ensure that ERA and EI focus on relevant and necessary information, the Advisory Committee considered opportunities to reduce the amount of mandatory data required for submissions. This included examining the contextual indicators used in ERA and the mandatory engagement indicators used in EI.

2.3.1 Removing ERA applied measures

The ERA methodology has always used a range of supporting or contextual information, in addition to the key quality indicators of citation analysis or peer review, to assist expert reviewers make their assessments. For the first three rounds of ERA this information included staffing data, publishing profiles, and indicators of research esteem, research income and research application.

The experience of previous rounds has shown that much of this information is valuable for assessment and reporting. It also made clear that some information was less valuable and potentially not worth the burden of data collection. For example, in response to overwhelming feedback from universities and assessors, indicators of research esteem were removed from ERA after the ERA 2015 round.

More recent stakeholder feedback has suggested that the indicators of research application in ERA (known as applied measures) may no longer provide the value for assessment or reporting to balance against collection burden. These applied measures included research commercialisation income, patents, and registered designs. In the vast majority of cases, applied measures did not affect the rating of a Unit of Evaluation. They were only used in cases where citation analysis or peer review placed a Unit of Evaluation at the boundary between two rating points. In these rare cases, exceptional performance in applied measures or research income could be used as evidence to give a Unit of Evaluation a higher rating. However, over time, the ERA methodology has placed less emphasis on applied measures as indicators of quality. This is compounded by the view that, since 2018, applied measures would be better considered as part of EI rather than ERA. Therefore, the Advisory Committee considered that applied measures could be removed entirely without affecting the robustness of the ERA methodology.

Recommendation 15: that the ARC remove applied measures from ERA, prior to ERA 2023.

2.3.2 Replacing mandatory EI indicators with a flexible evidence-based approach

In EI 2018, engagement narratives were supported by a suite of quantitative engagement indicators (based on research income). The Advisory Committee considered whether these mandatory indicators remain a suitable and efficient approach to providing evidence of engagement activity that balance the needs of assessment against the burden of data collection.

Feedback from the sector and advice from experts indicate that the current engagement indicator suite is too income-focused, emphasising engagement activities that have monetary exchange. This suite may fail to recognise engagements that lead to cost savings or greater efficiencies without financial exchange. For example, engagements with health policy makers or health services may lead to lives saved, improved health outcomes, or reductions in the cost of healthcare. Similarly, research engagements with community groups and not-for-profit organisations may lead to high levels of mutually beneficial engagement but low financial exchange. Feedback from EI assessors also highlighted that in many cases the mandatory indicators did not add value to the information that was already available through the engagement narratives.

In addition, since EI 2018 there have been changes to other government data collections that make future reporting of these indicators more challenging for universities. In EI 2018, some of the engagement indicators relied on data using the Australian Competitive Grants Register which was managed by DESE. This register is no longer maintained by DESE in

the same form; rather, universities are required to self-assess and report against set criteria. As a result, the collection of the relevant EI engagement indicators is less practical.

The Advisory Committee considered that there is no adequate metric that can quantify research engagement relationships in a 'one size fits all' approach, and that the nature of research engagement can be very discipline specific. Universities should determine the most appropriate metrics to demonstrate their engagement successes, on a discipline-by-discipline basis.

The Advisory Committee did, however, agree that co-supervision of research students with research end-users is a useful and broadly applicable indicator of good research engagement practice. This would provide a useful metric for EI assessors, as it furnishes evidence of mutually beneficial exchange, and can be collected using existing DESE data without increasing reporting burden on universities. The Advisory Committee noted that using DESE data collections means that the definition of joint supervision by a research end-user used by EI must align with the definition used by DESE. In cases where research students benefit from arrangements with research end-users that fall outside this definition, universities will be able to provide details in the narrative component of their submissions.

For impact studies, the view of many stakeholders and the Advisory Committee was that quantitative indicators should remain optional. Research conducted by the ARC for the review indicates there is no existing suite of indicators that is applicable across all disciplines and all types of impact. When indicators are used, they are highly specific to the impact being assessed and, most often, contextualised in an impact narrative. Even more so than for engagement, expert analysis and international best practice suggests that there is currently no set of quantitative indicators that adequately captures the broad range of research impacts. At this time, universities are best placed to identify the most appropriate indicators, tailored to specific impact studies.

While current impact indicators may not be fit for the purpose of EI, this is an ongoing area of interest for research evaluators around the world. It is possible that as this area develops in Australia and elsewhere, suitable impact indicators will be identified. The ARC should continue to engage with global experts in research evaluation to incorporate indicators into future EI rounds if possible.

Recommendation 16: that engagement indicators for EI be determined by the institution, to enable universities to include metrics in narratives that demonstrate evidence of engagement as required on a discipline-specific basis.

Recommendation 17: that the co-supervision of Higher Degree by Research students with research end-users be developed into a mandatory engagement indicator for EI 2024, using data drawn from the Department of Education, Skills and Employment.

Recommendation 18: that quantitative impact indicators remain optional for the assessment of research impact, and that the ARC continue to investigate and monitor international progress in the development of possible impact indicators to identify any that may be applicable to the future assessment of impact in EI.

3 Maintaining best practice in research assessment

The rigour of Australia's university research assessment system has always been a strong feature of the programs and has been essential to stakeholder support. In the years after ERA was established, an OECD study concluded that it was world leading.⁸

As a research assessment system for Australia, ERA and EI are tailored to the specific contexts, objectives, and structure of Australia's university research system. The fundamental principles of the assessment system include expert review, discipline-appropriate assessment methodology, and separate consideration of research excellence, engagement, and impact. These features make ERA and EI globally unique.

As part of the ARC's commitment to best practice, the review assessed the performance of ERA and EI against international standards of research assessment. This chapter discusses the fundamental strengths of ERA and EI in the context of international best practice, including recommendations to retain key aspects of the programs and opportunities for continuous improvement.

3.1 The fundamentals of the assessments are strong

The review confirmed that the fundamentals underpinning both assessment frameworks are robust and remain appropriate. Having examined the design elements and methodologies that the ARC adopted at the development of each program, the Advisory Committee considered that at a fundamental level they reflect international best practice in research assessment. Furthermore, the university sector and government highly value the results and data generated by the programs.

For ERA, the review found that the use of expert review continues to meet international best practice. Expert review ensures that bibliometric indicators of research quality are interpreted appropriately and that judgements on research quality accurately reflect best practice in a discipline. Furthermore, peer review is necessary for disciplines in which citation analysis is not a robust indicator of research quality.

The Advisory Committee also determined that ANZSRC FoR codes remain the most appropriate way to define Units of Evaluation. As a discipline-based assessment, ERA requires a classification system that accurately and consistently reflects the Australian university research landscape. As the ANZSRC FoR classification was recently revised through extensive consultation with the Australian research sector and expert stakeholders, it remains the most appropriate and up-to-date representation of research disciplines in the sector.

The Advisory Committee examined the issue of differences between HASS and STEM results and considered whether the ERA evaluation methodology is fair and appropriate. The review found that the dual methodologies – the use of peer review or citation analysis depending on the discipline under review – are appropriate and remain necessary to reflect disciplinary differences in publication practices. Although refinements for each methodology are necessary to ensure robustness and fairness, the fundamental basis of the dual methodologies is sound. Further discussion of the improvements recommended to address the differential between HASS and STEM ERA ratings can be found in Section 3.2.1.

For EI, the review found that the use of narratives remains the fairest and most effective way to assess a diverse range of engagement and impact strategies. Some sector feedback

⁸ Hicks, D. '[Overview of models of performance-based research funding systems](#)', in OECD, *Performance-based Funding for Public Research in Tertiary Education Institutions: Workshop Proceedings*, OECD Publishing, 2010.

suggested that ANZSRC Socio-Economic Objective (SEO) codes may be a more appropriate way to classify Units of Assessment for EI, as SEO codes classify research according to its intended purpose or outcome. The Advisory Committee felt that while SEO codes would be useful for analysis of mission-based research, switching to SEO codes would result in a misalignment with ERA, create additional work for universities, and would not deliver sufficient benefit to make the change worthwhile.

The Advisory Committee recommends maintaining the fundamentals of ERA and EI for future rounds.

Recommendation 19: that the dual methodologies of citation analysis and peer review continue in ERA, that disciplines continue to be assessed using the most appropriate methodology, and that ANZSRC 2020 FoR codes define Units of Evaluation in ERA and Units of Assessment in EI.

3.2 Continuous improvement is necessary

Although ERA and EI are world leading in many respects, continuous improvement ensures that the assessment process remains relevant, robust, and effective. Fairness and transparency are a high priority for the review. It is critical to ensure that ERA and EI remain credible assessments of Australia's research sector, and that the methodologies used in each program offer a level playing field for all disciplines and universities.

This section discusses opportunities for continuous improvement of ERA and EI processes. The following recommendations reflect the evolving contexts of research assessment in Australia. They are designed to ensure that the programs remain robust, fair, and transparent to universities and other stakeholders.

3.2.1 Refining peer review and citation analysis in ERA

Although the use of peer review and citation analysis on a discipline-specific basis reflects international best practice, the Advisory Committee considered there were ways to improve the transparency and fairness of the assessment process. This would also help address concerns among some in the university sector regarding miscoding of research and potential gaming of submissions.

During and prior to the review, stakeholders raised concerns regarding the differing performances of citation analysis (largely STEM disciplines) and peer review disciplines (largely HASS disciplines) in ERA. Since 2010, the number of STEM disciplines receiving above world standard ratings in ERA has increased at a faster rate than HASS. The underlying reasons are complex, involving factors beyond the scope of ERA, such as varying profiles in research staff, income, investment and capacity across different disciplines.

However, stakeholders also expressed concerns that the ERA peer review methodology is not comparable to the citation methodology, and that the concept of 'world standard' may unintentionally be set higher for peer review disciplines than in citation analysis disciplines. The Advisory Committee considered this issue and noted the advice it received from the ERA Assessment Methodology Working Group, which comprised the eight REC Chairs from ERA 2018. Based on this advice, the Advisory Committee recommends that the ERA rating scale, including the definition and appropriateness of the term 'world standard,' be investigated by a technical expert working group, as discussed in Recommendation 6, Section 1.2.2. The Advisory Committee considered that improving the selection and training of peer reviewers would mitigate other concerns.

Sector feedback has also highlighted a concern regarding optimisation or potential gaming in citation disciplines. Opportunities for optimisation are greater in citation disciplines. By modelling citation profiles in advance, universities are able to strategically assign research

outputs to certain FoR codes to achieve the best possible results. In peer review disciplines, it is harder for universities to predict and optimise performance in this way. Similarly, in the citation methodology, evaluators have a limited ability to detect and act against miscoding. In peer review disciplines, evaluators can identify and discount miscoded outputs more easily.

The Advisory Committee considered that empowering ERA expert reviewers to exclude miscoded outputs would address this concern. Similarly, publishing the FoR assignment and metadata of research outputs after each ERA round (as set out in Recommendation 9, Section 1.3) would improve the transparency of ERA and university submissions. Finally, annual reporting of outputs (Recommendation 13, Section 2.2.1) would limit universities' ability to optimise submissions at the end of a reference period.

The Advisory Committee recommends working towards implementation of the improved peer review methodology and enhanced authority for ERA RECs in time for ERA 2023.

Recommendation 20: that further steps be taken to ensure the robustness of the peer review and citation methodologies used in ERA. In particular:

- a. Improve the application of the peer review methodology to ensure the appropriate application of 'world standard' (in consultation with the expert working group referred to in Recommendation 6), increase the size, quality and diversity of the peer reviewer pool, and improve training of peer reviewers.
- b. Provide Research Evaluation Committees with authority to exclude Units of Evaluation or research outputs where significant miscoding has occurred and request a recalculation of citation profiles.

3.2.2 Refining EI definitions

The EI assessment documentation defines key terms to ensure a common understanding and consistent application of certain concepts throughout the submission and assessment processes. The terms defined in EI 2018 included: research, engagement, impact and end-user. The review considered the suitability of these definitions and whether EI requires any additional definitions.

Through public sector feedback and targeted consultations, the review found that the existing definitions are generally sound and most should remain the same. However, some definitions could be improved to assist universities with their submissions.

The review recommends expanding the definition of 'research end-user' to include publicly funded research organisations (PFROs). The original rationale for excluding PFROs was to ensure that EI focused on activities beyond academia, rather than 'business as usual' research. However, the review found that the benefits of including PFROs outweigh the benefits of exclusion. The Advisory Committee observed that many PFROs are heavily involved in research translation and that university partnerships with PFROs frequently result in beneficial impacts. This means that under the existing definition, some relevant research activity may be excluded. Including PFROs would also align the EI end-user definition with the definition used by DESE, improving consistency across government. The Advisory Committee advised that the ARC should provide guidance emphasising the nature of the impact or intent of the activity rather than the type of organisation.

To support the remaining definitions, the review recommends providing additional guidance and examples – especially around the definition of 'mutual benefit' (a common source of confusion) and how universities will be evaluated. As EI 2018 case studies that received a high rating are publicly available, universities will be able to draw on these case studies as best practice examples in future EI rounds. The Advisory Committee considered that there is benefit in the ARC drawing on this material to develop additional guidance.

Assessing engagement, impact, and approach to impact separately is a unique feature of EI, as compared to similar international assessments. However, approach to impact was not defined in EI 2018 and stakeholders reported confusion about the differences between approach to impact and engagement. Defining approach to impact would help to distinguish the purpose and requirements of the two components.

Recommendation 21: that the ARC substantially retain the existing definitions for EI, with the following adjustments:

- a. That the definition of 'research end-user' for EI be expanded to include publicly funded research organisations, with guidance emphasising the nature of the impact or intent of the activity rather than the type of organisation.
- b. That the ARC develop additional guidance with examples to support the definitions of impact, engagement, and research end-user.
- c. That the ARC develop a definition of 'approach to impact.'

3.3 Looking forward

Research assessment is a rapidly evolving field. Internationally, research assessment experts increasingly are turning their attention to the activities and infrastructure that *support* high quality research. Some research assessment literature highlights the risk that traditional research assessment may inadvertently reduce the amount of time that universities and researchers dedicate to research integrity processes and support activities, which include essential research workforce development and critically important quality assurance mechanisms such as academic peer review. Recognising this work through research assessment would be one way to mitigate this risk, and to acknowledge the labour and resources that support excellent research.

In this emerging but still contested view, research excellence means more than a direct focus on research publications or output. It means excellence in the activities, environment and infrastructure that make high-quality research possible. This expanded definition of research excellence is evident in moves by the United Kingdom's Research Excellence Framework (REF) and New Zealand's Performance-Based Research Fund to assess the research environment and individual contributions to the health of the discipline. It is also evident in movements such as the Hidden REF, a competition designed to recognise a diverse range of research outputs and research support activities that the REF does not capture. In Australia, the National Health and Medical Research Council's *Research Quality Strategy* (2019) highlights the importance of research culture and research practices as integral components of research quality.

The ARC is committed to continuous improvement. The Advisory Committee considered these developments with interest. However, to be incorporated into ERA and EI, an expanded understanding of research excellence would require extensive consultation with the sector and further analysis by the ARC. The Advisory Committee recommends conducting future work in this area to ensure that ERA and EI continue to meet the evolving standards of international best practice.

Recommendation 22: that the ARC continue to monitor international and best practice understandings of research excellence and investigate how they may be incorporated into future rounds of ERA and EI.

Appendix A – Review Aims, Terms of Reference and Advisory Committee

In 2020, the ARC commenced a review of ERA and EI, following the fourth round of ERA and the first round of EI. The review followed a House of Representatives inquiry into Australian university funding arrangements, which also examined university experiences with ERA and EI.⁹

Aims

The aims of the review were to enable the ARC to:

- respond to the ongoing needs of the university sector, government, and the public for a robust evaluation of Australian university research quality, impact, and engagement
- simplify and streamline ERA and EI
- take advantage of recent developments in technology and big data
- ensure that ERA and EI continue to reflect world's best practice.

Terms of Reference

The review considered:

- the purpose and value of research evaluation, including how it can further contribute to the Government's science, research, and innovation agendas
- the extent to which ERA and EI are meeting their objectives to improve research quality and encourage university research engagement and impact outside of academia
- the effects of both ERA and EI on the Australian university research sector, whether positive or negative, intended or unintended
- opportunities to streamline the ERA and EI processes to reduce the reporting burden on the research sector (as recommended by the House of Representatives Report, *Australian Government Funding Arrangements for non-NHMRC Research*) noting the guiding principles of ERA and EI are:
 - robust and reliable methodologies
 - applicability of the methodologies across disciplines
- opportunities for coordination of research data reporting and analysis across government, thereby improving whole-of-government reporting capability and reducing the reporting burden on universities
- publicly available data sources and new developments in technology and products to capture research evaluation data
- the frequency of ERA and EI the appropriateness and robustness of the ERA and EI methodologies.

Advisory Committee

As part of the review of ERA and EI, the ARC appointed an external, expert Advisory Committee (comprised of experts from government, universities, and research end-users, as well as experts in research evaluation) to advise the ARC CEO on key issues. The Advisory Committee considered issues in the context of the review aims and terms of reference. The

⁹ House of Representatives Standing Committee on Employment, Education and Training, *Australian Government Funding Arrangements for non-NHMRC Research*, 2018.¹⁰ See, for example, Statement of Principles on Scientific Merit Review 2012 and Statement of Principles on Peer/Merit Review 2018.

Advisory Committee was chaired by Emeritus Professor Michael Brooks, The University of Adelaide. The members of the Advisory Committee were:

Name	Title
Emeritus Professor Michael Brooks (Chair)	The University of Adelaide
Mark Bazzacco	Director of Strategy and Chief of Staff, CSIRO
Professor Joy Damousi	Director, Institute of Humanities and Social Sciences, Australian Catholic University
Dr Gemma Derrick	Senior Lecturer (Higher Education), University of Lancaster
Dominic English	First Assistant Secretary, Higher Education Division, Department of Education, Skills and Employment
Dr Alan Finkel	Chief Scientist Australia (2017 – 2020) (until December 2020)
Dr Cathy Foley AO	Chief Scientist Australia (from January 2021)
Catriona Jackson	Chief Executive, Universities Australia
Professor Anne Kelso AO	Chief Executive Officer, National Health and Medical Research Council
Su McCluskey	Commissioner, Australian Centre for International Agricultural Research
Professor Emeritus Ian O'Connor AC	Chair of the Higher Education Standards Panel (until March 2021)
Emeritus Professor John O'Connor	Conjoint Professor, School of Mathematical and Physical Sciences, The University of Newcastle
Janean Richards	Head of Division, Science and Commercialisation Policy, Department of Industry, Science, Energy and Resources (from October 2020)
Dr Mathew Trinca AM	Director, National Museum of Australia
Jane Urquhart	Head of Division, Science and Commercialisation Policy, Department of Industry, Science, Energy and Resources (2020) (until October 2020)
Professor Maggie Walter	Distinguished Professor of Sociology, University of Tasmania, Previous Pro Vice-Chancellor – Aboriginal Research and Leadership
Innes Willox	Chief Executive, Australian Industry (AI) Group

Appendix B – Summary of Consultation

The ERA EI Review consultation process was designed to ensure that the methodologies and objectives of ERA and EI meet the needs of stakeholders including universities, government, and stakeholders outside of academia. The ARC conducted a public consultation, convened three specialist working groups, and held targeted stakeholder consultations to advise the Advisory Committee on specific issues.

Public Consultation

As part of the review, an eight-week public consultation was held to collect stakeholders' views on a range of key issues. The consultation opened on 12th August with the release of the ERA EI Review [Consultation Paper](#). The paper, supported by a survey instrument, posed a series of questions on ERA, EI, and overarching issues common to both programs.

A total of 112 submissions were received including 38 submissions from universities, 14 from peak discipline bodies, 22 from researchers, and nine from university employees (Figure 1).

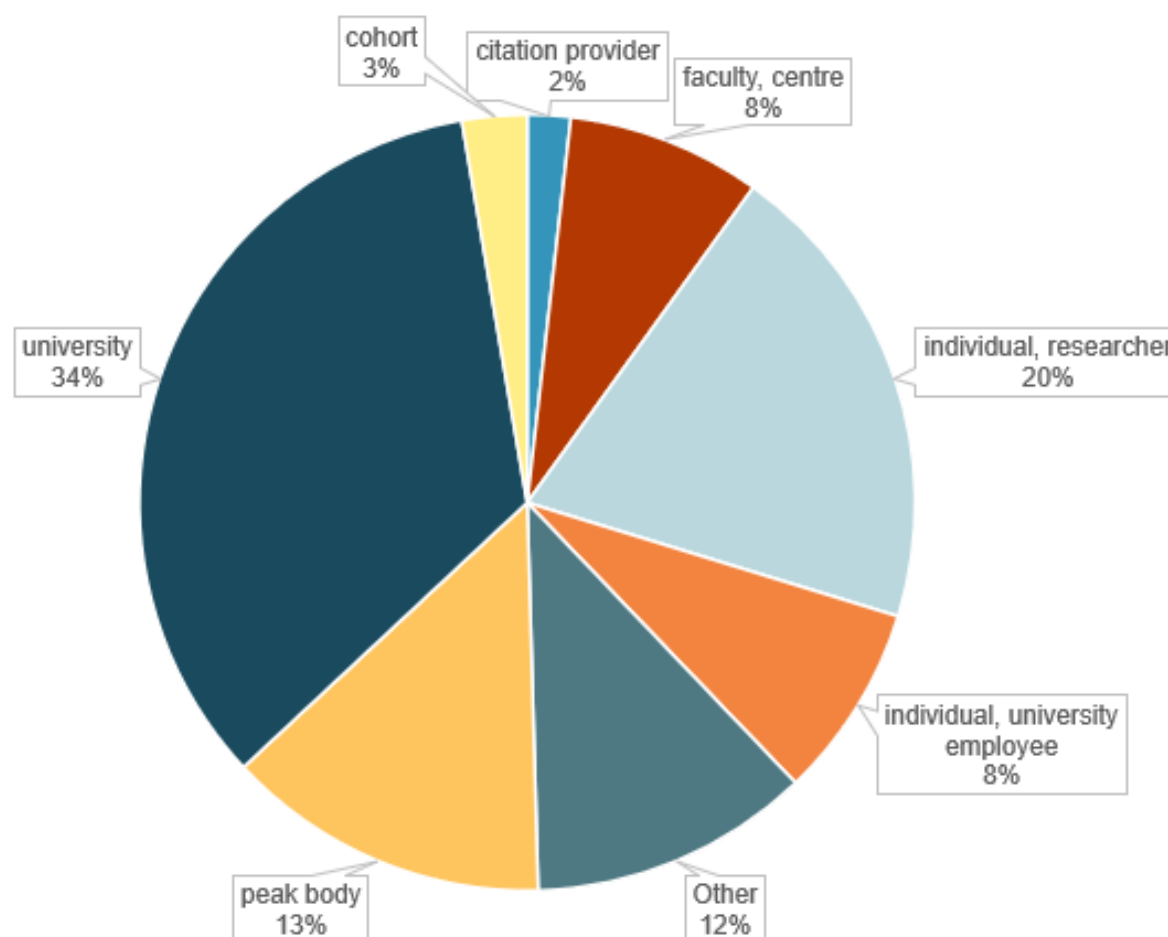


Figure 1 - Breakdown of ERA EI Review submissions by category

Submissions were published on the ARC website on 17 December 2020. At the request of the authors, some submissions were not published. All submissions made in response to the *ERA EI Review Consultation Paper* that were not marked 'do not publish' are available on the ARC website: www.arc.gov.au/era-ei-review.

Specialist Working Groups

To support the Advisory Committee, the ARC appointed three working groups to provide expert advice on specific issues.

ERA Assessment Methodology Working Group

This group comprised the eight ERA 2018 Research Evaluation Committee (REC) Chairs, selected for their recent experience and expertise with ERA assessment. Its purpose was to examine stakeholder concerns about the differences in the performance of humanities and social sciences disciplines and science, technology, engineering and mathematics disciplines in ERA and advise on what changes, if any, were required to address the issue.

Members were as follows:

Name	Title
Professor Rose Amal	Scientia Professor, School of Chemical Engineering, UNSW Sydney
Professor Hugh Barrett	Dean, Faculty of Medicine and Health, The University of New England
Professor Brenda Cherednichenko	Emeritus Professor, Faculty of Arts and Education, Deakin University
Emeritus Professor Graeme Turner AO FAHA	Emeritus Professor, Institute for Advanced Studies in the Humanities, Faculty of Humanities and Social Sciences, The University of Queensland
Professor David Green	Department of Data Science and AI, Monash University
Professor Eleanor Mackie	Honorary Professorial Fellow, Department of Veterinary Biosciences, The University of Melbourne
Professor Flavio Menezes	Professor of Economics, School of Economics, The University of Queensland
Emeritus Professor John O'Connor	Conjoint Professor, College of Engineering, Science and the Environment, The University of Newcastle

Engagement Narrative Working Group

Members of this group were selected for their previous experience in EI assessments, either as a Chair or a research end-user member of the EI 2018 assessment panels. Its purpose was to provide advice on key questions regarding the engagement narratives, EI definitions, and the assessment of research engagement.

Members were as follows:

Name	Title
Dr Jillian Comber	Director, Comber Consultants Pty Ltd
Professor Richard Dunford	Emeritus Professor, UNSW Business School, UNSW Sydney
Mr Andrew Gilbert	Chief Executive, Bioplatforms Australia
Professor Gerard Goggin	Wee Kim Wee Professor of Communication Studies, Nanyang Technological University, Singapore
Professor John Grundy	Professor of Software Engineering, Monash University
Ms Louise Hanlon	Independent Consultant
Dr Erol Harvey	Head Development and Translation, Bionics Institute CEO of the Aikenhead Centre for Medical Discovery (ACMD)
Professor Terry Nolan AO	Head, Vaccine and Immunisation Research Group (VIRGo) Peter Doherty Institute for Infection and Immunity, and Murdoch Children's Research Institute The University of Melbourne
Professor Maggie Walter	Distinguished Professor of Sociology, University of Tasmania, Previous Pro Vice-Chancellor – Aboriginal Research and Leadership

Indigenous Working Group

This group comprised Aboriginal and Torres Strait Islander researchers who were selected for their previous experience with ERA or EI and with consideration of cultural appropriateness. Its purpose was to provide expert advice on a range of matters relating to Indigenous research for both programs. The work of the group forms part of a broader consultation strategy involving Indigenous and non-Indigenous stakeholders.

Members were as follows:

Name	Title
Professor Michelle Trudgett (Chair)	Pro Vice-Chancellor Aboriginal and Torres Strait Islander Education, Strategy and Consultation, Western Sydney University
Professor Gawaian Bodkin-Andrews	Professor, Centre for the Advancement of Indigenous Knowledges, University of Technology Sydney
Professor Kathleen Clapham	Professor (Indigenous Health), Australian Health Services Research Institute, University of Wollongong
Associate Professor Michelle Evans	Associate Professor, Management and Marketing, University of Melbourne
Associate Professor Sandy O'Sullivan	Associate Professor, Creative Industries, University of the Sunshine Coast
Professor Irene Watson	Pro Vice Chancellor: Aboriginal Leadership and Strategy, University of South Australia

Other Consultation

In addition to the public consultation phase and specialist working groups, the ARC also undertook targeted consultation and analytical work to support the review. This included:

- Impact Study Research Project – an external analysis of the impact component of EI 2018, led by Professors Terry Nolan (University of Melbourne) and Johnathan Grant (King's College London).
- End-user stakeholder consultation – to determine how the value of ERA and EI can be improved for research end-users.
- Internal data analysis on key issues – including, but not limited to:
 - Methods of determining ERA researcher eligibility – staff census date vs. staff by-line
 - ERA benchmarking and rating scale
 - Simplifying and streamlining measures for ERA and EI
 - Aboriginal and Torres Strait Islander research in ERA and EI
 - End-user stakeholders' use of ERA and EI data

Analysis of other systems for assessing engagement and impact both inside and outside of academia.

Appendix C – ERA EI Background and Methodology

A key responsibility of the Australian Research Council (ARC) is to assess the quality, engagement and impact of Australia's university research through its Excellence in Research for Australia (ERA) and Engagement and Impact (EI) assessments. ERA is an assessment of research quality and identifies and promotes excellence across the full spectrum of research activity. EI assesses how well researchers are engaging with end-users of research and shows how universities are translating their research into economic, social, environmental, cultural, and other impacts.

Excellence in Research for Australia

ERA is a comprehensive assessment of the quality of research produced by Australian universities. ERA was trialled in 2009 and first conducted in 2010 with subsequent rounds in 2012, 2015 and 2018. The Australian Government announced in September 2019 that the next ERA round will be held in 2023.

ERA evaluations are made by expert reviewers who determine the overall research quality of each research-active discipline at a university. ERA does not produce ratings for individual researchers or publications.

The outcomes of ERA evaluations are published via a national report which includes ratings of all research active disciplines at every Australian university. It also provides a comprehensive picture of the Australian university landscape, with data on university researchers, research outputs, and research income at a fine-grained discipline level which is not available in other collections.

ERA 2018

Objectives

The specific objectives of ERA 2018 were to:

1. establish an evaluation framework that gives government, industry, business and the wider community assurance of the excellence of research conducted in Australian higher education institutions
2. provide a national stocktake of discipline level areas of research strength and areas where there is opportunity for development in Australian higher education institutions
3. identify excellence across the full spectrum of research performance
4. identify emerging research areas and opportunities for further development
5. allow for comparisons of research in Australia, nationally and internationally, for all discipline areas.

Methodology

To evaluate performance, ERA 2018 used expert review of a range of indicators of research excellence to provide discipline-level ratings for each university. A summary of the assessment process is shown in the flowchart below. Further information on each element is provided in the text that follows.

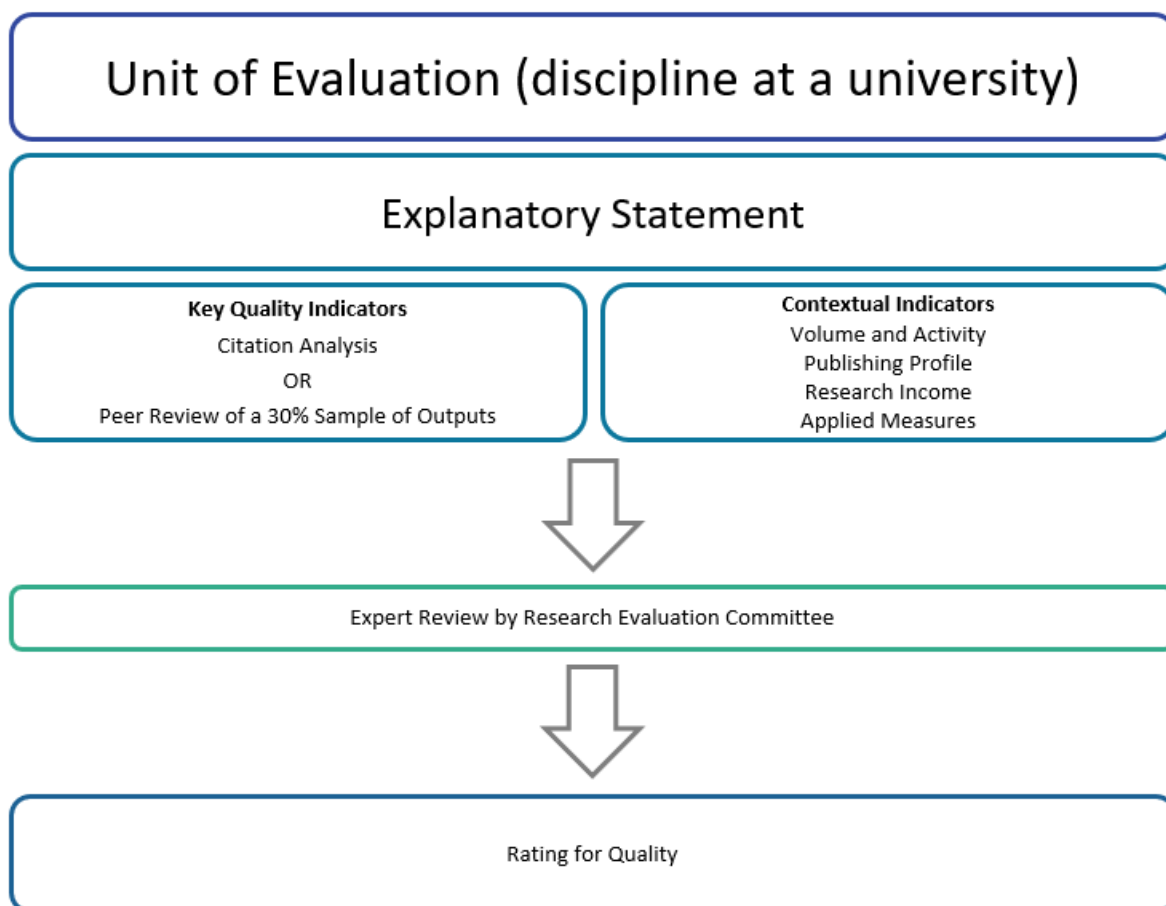


Figure 2 - ERA Assessment Flowchart

Unit of Evaluation

ERA 2018 assessed the quality of university research by Unit of Evaluation – that is, broad and specific disciplines at each university. Disciplines were defined using the 2008 Australian and New Zealand Standard Research Classification (ANZSRC) Fields of Research (FoR) codes, where 2-digit codes referred to broad disciplines and 4-digit codes referred to specific disciplines.

Universities were responsible for assigning all their research outputs to the relevant disciplines using the criteria set by the ARC in the *ERA 2018 Submission Guidelines* (available on the ARC website), especially the requirement that outputs must only be assigned to disciplines that reflect the output's research content.

Low Volume Threshold

To be assessable in ERA 2018, a discipline at a university must meet a low volume threshold for research activity. This threshold was 50 apportioned research outputs published within a six-year reference period. The ERA 2018 Submission Guidelines provide details regarding how the low volume threshold was calculated. The same threshold applied for broad disciplines and specific disciplines.

Key Quality Indicators and Benchmarking

Research quality was evaluated by RECs based on either citation analysis or peer review of a sample of research outputs, depending on the discipline. These research quality indicators were the key drivers of ERA 2018 ratings. Other contextual indicators were used as supporting information as described below.

Citation Analysis

Citation analysis is a way of measuring the relative importance of an author, an article or a publication by counting the number of times that author, article, or publication has been cited by other works. Citation analysis is widely accepted internationally as a proxy measure for determining research quality.

However, citation analysis can only be used for disciplines which publish a high proportion of their outputs in journals for which citation data is collected. For citation analysis in ERA – commonly used in sciences and engineering disciplines – RECs used a set of metrics for each Unit of Evaluation that are benchmarked against the world's performance. To enable meaningful comparison and robust statistical analysis, ERA 2018 used benchmarks and citation data adjusted for discipline and year, rather than raw citation counts.

Peer Review

Academic peer review is widely considered to be one of the gold standards for determining research quality. The Global Research Council recognises that peer review has long been a primary way of assessing research excellence¹⁰ and it is used in the selection of journal articles for publication, grant allocation, academic promotions and awarding of prizes. In ERA, it is commonly used in the humanities, social sciences, and information and computing sciences – disciplines for which citation analysis is not a robust indicator of research quality.

In peer review disciplines, each Unit of Evaluation has:

- A 30 per cent sample of research outputs nominated by the university for peer review
- All research output types included in the sample (including journal articles, books, book chapters, conference papers and non-traditional research outputs such as creative works)
- External expert peer reviewers who review and report on the quality of outputs to assist in REC judgments of a Unit of Evaluation.

Explanatory Statement and Contextual Indicators in ERA 2018

To assist RECs in understanding the Units of Evaluation they are rating, each unit evaluated in ERA 2018 included an explanatory statement and a range of contextual indicators. The explanatory statements were provided by universities for each broad discipline. They provided context for the data universities submit and an opportunity to identify additional factors (such as any apparent anomalies or unusual patterns in the data) that REC members may need to take into account in making an informed evaluation.

Contextual indicators used in ERA 2018 included:

- Volume and activity – research outputs, staffing profile by academic level, research output by year
- Publishing profile – research output metadata presented by output type: books, book chapters, journal articles and conference publications
- Research income – Higher Education Research Data Collection (HERDC) Categories 1, 2, 3, and 4.
- Applied Measures – patents, research commercialisation income, plant breeder's rights, registered designs, and National Health and Medical Research Council (NHMRC) endorsed guidelines.

¹⁰ See, for example, Statement of Principles on Scientific Merit Review 2012 and Statement of Principles on Peer/Merit Review 2018.

ERA 2018 Ratings

RECs provided ratings for each broad discipline and specific discipline that meet the low volume threshold. ERA 2018 used a five-point rating scale. The rating scale was broadly consistent with the approach taken in research evaluation processes in other countries to allow for international comparison.

Rating	Descriptor
5	The Unit of Evaluation profile is characterised by evidence of outstanding performance well above world standard presented by the suite of indicators used for evaluation.
4	The Unit of Evaluation profile is characterised by evidence of performance above world standard presented by the suite of indicators used for evaluation.
3	The Unit of Evaluation profile is characterised by evidence of average performance at world standard presented by the suite of indicators used for evaluation.
2	The Unit of Evaluation profile is characterised by evidence of performance below world standard presented by the suite of indicators used for evaluation.
1	The Unit of Evaluation profile is characterised by evidence of performance well below world standard presented by the suite of indicators used for evaluation.
n/a	Not assessed due to low volume. The number of research outputs does not meet the volume threshold standard for evaluation in ERA.

Engagement and Impact

EI assesses how well universities and researchers are engaging with end-users of research and shows how universities are translating their research into economic, social, environmental, cultural and other impacts.

The Australian Government first announced the development of an engagement and impact assessment in December 2015, as part of its National Innovation and Science Agenda. This followed the Review of Research Policy and Funding Arrangements (2015), which recommended a national assessment of engagement and impact as a way of improving university collaboration with industry. EI was piloted in 2017, and the inaugural EI assessment took place in 2018 as a companion exercise to ERA 2018. The next EI round will occur in 2024.

EI assessments are made by expert reviewers who examine the engagement and impact of research for each research-active discipline at a university. The outcomes of EI evaluations are published via a national report which includes ratings of all eligible disciplines at every Australian university.

EI 2018

Objectives

The specific objectives of EI 2018 were to:

- provide clarity to the Government and Australian public about how their investments in university research translate into tangible benefits beyond academia
- identify institutional processes and infrastructure that enable research engagement
- promote greater support for the translation of research impact within institutions for the benefit of Australia beyond academia
- identify the ways in which institutions currently translate research into impact.

Methodology

EI 2018 used expert review of narrative case studies and supporting quantitative information to assess:

- how universities are engaging with research end-users ('engagement')
- the economic, environmental, social, cultural and other benefits of research ('impact') and
- how universities supported the translation of the research into impact ('approach to impact').

The flowchart below provides an outline of the assessment process. Further information on each element is provided in the text that follows.

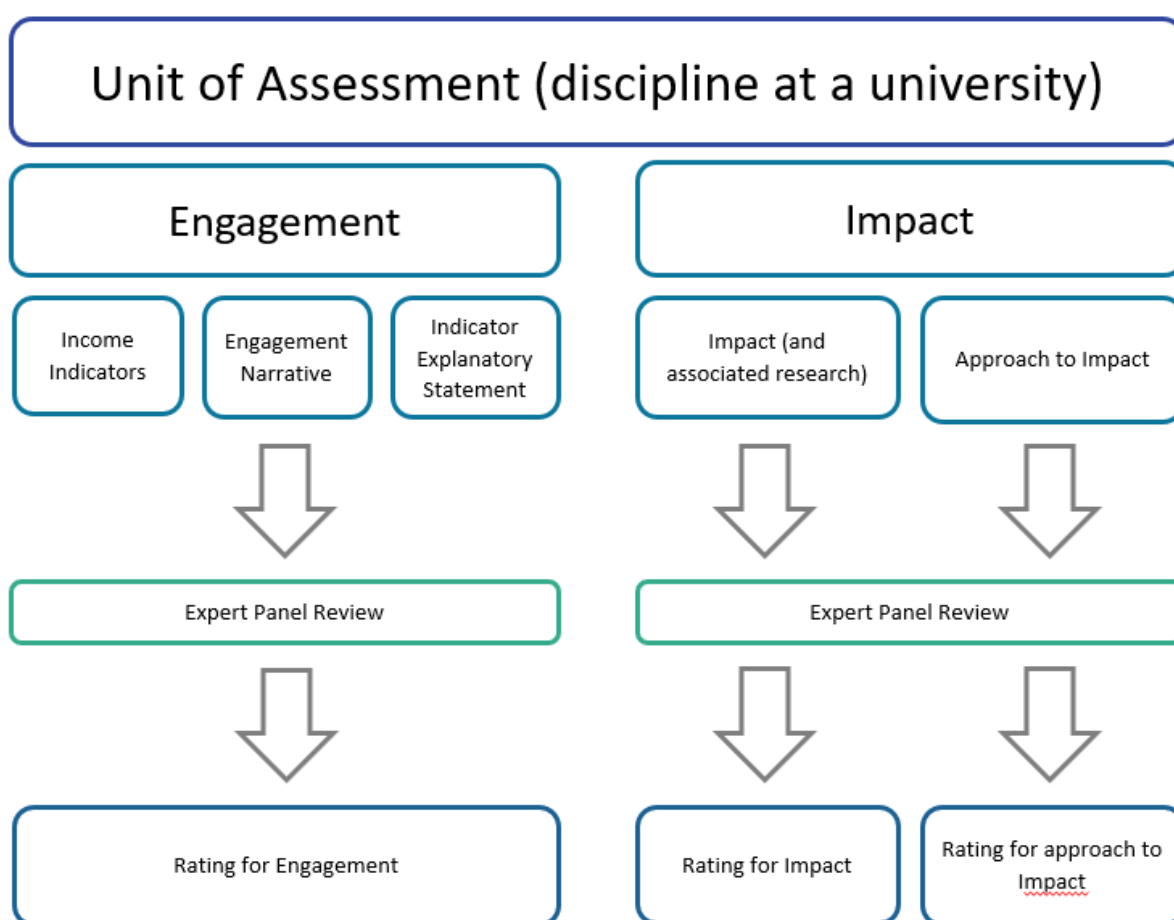


Figure 3 - EI Assessment Process

Units of Assessment

The Unit of Assessment for EI 2018 was the broad discipline (defined by 2-digit 2008 ANZSRC FoR codes) at each university, with the following exceptions:

- Medical and Health Sciences was divided into two groups – Biomedical and Clinical Sciences, and Public and Allied Health Sciences – due to the diversity and high volume of research in this discipline.
- Universities could submit one interdisciplinary impact study for impact assessment only.
- Universities could submit one Aboriginal and Torres Strait Islander research impact study for impact assessment only.

Low Volume Threshold

EI 2018 used a low volume threshold to determine whether a university was expected to make a submission for a given discipline (subject to the 'request not to assess' provision noted below). The low volume threshold was 150 weighted apportioned outputs (one book counts as five) based on a university's relevant submission.

Universities could opt-in to a Unit of Assessment if they did not meet this threshold (in either engagement or impact or both). For impact only, a university could request not to be assessed despite meeting the low volume threshold if the broad discipline mainly focused on fundamental research rather than impact beyond academia, or was new to the university and researchers had not had sufficient time to make an impact beyond academia.

Engagement

The engagement component of the assessment comprised:

- an engagement narrative – which describes the overall engagement activity, strategies and/or objectives for the broad discipline at the university and may include additional quantitative evidence not part of the engagement indicator data (described below)
- engagement indicators:
 - cash support from research end-users (specified HERDC Category 1 and HERDC Categories 2, 3, and 4)
 - HERDC research income per FTE
 - proportion of specified Category 1 grants to all HERDC Category 1 grants
 - research commercialisation income
 - engagement indicator explanatory statement (to provide context and explain their engagement indicator data).

Impact

The impact component of the assessment was designed to assess the contribution that research has made to the economy, society, environment, or culture, beyond the contribution to academic research, and the ways in which universities have facilitated the translation of research into impact.

Universities submitted a single impact study for each broad discipline. The impact studies had two main sections:

- Impact – where universities provide details on the impact and the associated research that led to the impact. This should identify who or what has benefitted from the results of the research and give evidence that describes the extent of the impact.
- Approach to impact – where universities provide details on how they facilitated realisation of the impact. The aim of this section is to highlight the mechanisms and strategies the university had in place to support translating the associated research into the impact described in the study.

In addition to the above two sections, the impact study required universities to provide details of the research associated with the impact.

El Ratings

EI 2018 used a three-point rating scale, with ratings being 'High', 'Medium', or 'Low'. There were three separate ratings per Unit of Assessment – one for engagement and two for impact (with the approach to impact and the impact example rated separately). All ratings were determined by assessment panels that comprised a mix of distinguished academic researchers and highly experienced research end-users.