Review of ERA and E&I
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The Review

Australia's continued prosperity and wellbeing depends on a high-quality, focussed research system with excellence at its core. University research is a significant component of the nation's overall effort. Australian universities collectively are responsible for 34 percent of research and development expenditure, according to the most recently available statistics.[1] With almost $9.5 billion of the nation's $33 billion expenditure on research and development originating from the Australian Government it is important the nation enjoys a level of confidence and assurance in the quality and impact of the national research enterprise.[2]

Australia's system of national research evaluation has now been in operation for more than a decade. It is appropriate to consider the design of Excellence in Research in Australia (ERA), the effect of "Engagement and Impact" (E&I) as well as global developments in research evaluation, both those performed by government and non-government organisations.

In considering Australia's national system of research evaluation, there needs to be an acknowledgment that these systems have limitations. While they can provide insights into the excellence and impact of Australian research, research evaluation in and of itself cannot provide a comprehensive picture. Scientific discovery and innovation depends on a mix of basic (discovery) and applied research, on interdisciplinary insights, the varied pace of work, personal motivations and serendipity that lies beyond the gaze of metrics and research assessment exercises. Care, therefore, needs to be taken in extrapolating the results of any research evaluation exercises to solely providing a guide to the allocation of resources and funding, whether at a system level or within individual institutions.

Research evaluation and quality assurance

Governments undertake research evaluation for several reasons. These include quality assurance, demonstration of the effective use of resources, assisting in the analysis of research, aiding in the advocacy within government for the allocation of resources to meet national research objectives, and providing an objective basis for the distribution of resources.[3] In keeping with this, ERA was originally designed as a mechanism to guide investment in research, inform the allocation of funding and provide for a form of quality assurance.[4]

It is not clear that ERA, in its current form, is achieving these objectives. It does not usefully guide resource allocation by government. Nor are the rankings from either ERA or E&I very useful from a policy, research management or industry perspective.

Further, it is not clear that ERA's rankings have strategic relevance or impact, and the links between ERA and policy outcomes, or indeed quality outcomes, are not clear. There are a number of valid criticisms of the policy outcomes of ERA and its overall effectiveness.[7,8]

In its current form, it is not clear that ERA is the most cost-effective, practical, or relevant means of assessing research quality. Since the first pilot in 2009, the availability of data and metrics on research has changed remarkably. IN many science disciplines, reliable, useful, internationally relevant metrics are readily available and can inform university recruitment (staff and student), investment and marketing with relatively low administrative burden.

Globally, national research evaluation systems are competing with quantitative, internationally recognised, research relevant, verifiable, time-bound rankings with behavioural impact, which are able to be used to identify excellence. Many rankings provide additional analysis at the faculty and discipline level. In this context, ERA is a single assessment among many. The international nature of these indicators also allows benchmarking for disciplines worldwide.

Care should be taken for relying on research evaluation, be it of excellence or impact, to drive policy objectives around collaboration. Government, Business and Industry are unlikely to rely on rankings of institutions, preferring instead to interact with skilled individuals/groups regardless of the institutional location. There is little indication that good ERA rankings drive additional business investment.

What are the shortcomings?

Academics must be committed to producing high quality, high relevance, internationally recognised, research outputs, because that is what was needed to build both an academic and a research career. In many arenas, ERA is seen as a hindrance to good quality research rather than an incentive. Strong feedback from the Fellows of the Australian Academy of Science, and members of its National Committees for science is that ERA requires change.

ERA is easily gamed, and can be distorted (for example, by staff movements or targeted categorisation of research outputs). Because of this, ERA encourages a high level of "teaching to the test": researchers are encouraged to follow a metric-based research program targeting high impact journals and high citation topics. There is a disincentive to publish in specialised journals, even where those journals provide better access to relevant peer audiences.

ERA suffers from the distortions of a science and research system that is fragmented, and for whom responsibility and direction is shared between multiple Commonwealth Departments, governments, and bodies. As such ERA gives an incomplete and distorted view of the overall research sector. Quality assessments for medical research institutes, publicly funded research agencies and government research groups should be aligned with ERA as much as possible, to allow comparisons.

Can it be improved?

There are always recommendations for potential improvements, to reduce the administrative burden and improve the utility of the assessment:

- Reduce frequency to at least six years. There is scepticism that research quality will change in a measurable way in smaller timeframes. Given that the administrative burden is often cited against ERA, a frequency of no more than once every six years is recommended. ERA and E&I should be offset, so that the impacts of each do not overlap.
- A universal (ORCID-based) database to inform ERA, ARC, NHMRC etc. data sets, to minimise data entry requirements.

- Subject to suitability, use data from grant applications and final reports, as well as the HERDC datasets.
- Provide clarity in the rankings. It is not always clear what "world standard" means in different disciplines. Currently world standard can be conflated with "average". More scales could provide more differentiation and meaning to the rankings.
- Include a feedback mechanism to research organisations on impacts on their diversity, including gender and other factors. This may involve providing additional resources to research organisations for data collection. The data collected on gender has been critical in understanding issues facing women in STEM and designing the Women in STEM Decadal Plan.
- The assessments and ratings for peer review fields should be normalised against citation analysis fields.

The Australian government should also support research quality, by providing resources for research quality, research integrity and research training measures. In addition, supporting research through additional research council funding will address the "quality gap" of research proposals that are identified as being high quality, but are left unfunded.

Engagement and Impact

Unlike ERA, the ARC's Engagement and Impact analysis provides insight and perspective not easily gained elsewhere. Engagement and Impact are at the core of the purpose of research. It is useful to have independent, comparable assessment of the extent to which universities engage with the broader community and provide effective insight and value into non-academic systems. The Academy is broadly supportive of the E&I program.

However, the Academy makes the following recommendations:

- The greatest form of impact a university has on society is in the form of its graduates: university graduates go on to influence society in every sector and at every level. Refinement and better use of the graduate employment data reported under the Quality Indicators for Learning and Teaching (QILT) program could deepen the E&I national report.
- The distinction between "engagement" and "impact" is largely artificial.
- Definitions should be improved and made more detailed, especially for key terms such as 'end users' and 'engagement'.
- There is insufficient recognition of differential impact timelines for disciplines; some fields have demonstrated evidence of disparate timelines.
- Government funded research agencies, such as CSIRO, ANSTO and DSTG are not considered end-users of research. This is inaccurate and it devalues the role of universities in providing baseline technology to these agencies, to the benefit of the broader community.
- On the same theme nor are universities considered end users of research when this can often be palpably true. Innovation in a range of areas across the modern university comes from research, and efforts should be made to find a robust way of recognising this.

- A potentially highly useful output for the E&I assessment is pin-point examples of absolute best practice across the research sector. This would allow other universities to adopt best practice and improve engagement across the sector. Further, E&I should publish all case studies, not just those with the highest ratings.
- The principles of Indigenous-led research is integral to understanding impact or 'excellence' – e.g. how are community relationships developed in the delivery of research in peer review and assessing quality, and ensuring appropriate community involvement in the project design, undertaking research and assessing the impact on community life. The ARC has already recognised these principles in its 2018 evaluation of Indigenous research and the current E&I process reflects this.

Publication of ERA and EI outcomes

It would be preferable if the outcomes were presented in a clear and accessible format, both for human readers (in the form of clear, easy to read pdf reports, for example) and machine readers (complying with FAIR principles and available at data.gov.au).

Rubric style feedback for components that contribute to ratings in peer review codes would assist in interpretation of these results.

To discuss or clarify any aspect of this submission, or to arrange further consultations with the Academy and its Fellowship, please contact Dr Stuart Barrow at stuart.barrow@science.org.au or 02 6201 9464.

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