Measuring research impact in Australia

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The implementation of the national Research Engagement and Impact Assessment in Australia provides a timely opportunity to review attempts to improve the non-academic impact of academic research. The impact agenda represents a new phase in academic research evaluation and funding, characterised by a heightened need to demonstrate a return on public investments in research. New imperatives seek the reorientation of some academic research towards more directly driving national innovation, meeting the needs of business, and contributing to improved social and economic outcomes. This paper reviews the policy journey of research impact in Australia from the proposed, but never implemented, Research Quality Framework (RQF) to the National Innovation and Science Agenda (NISA). Our analysis of policy developments from the Howard to the Turnbull Governments highlights the controversial nature of research impact assessment and the political and methodological challenges that have accompanied its implementation.

Keywords: Higher education, research funding, research evaluation, impact and engagement, innovation policy.

The Engaged University

Universities have always been engaged with the economy and society around them. However, in recent years perspectives on this engagement have changed. Considering the history of the university, the emphasis on research and publication is relatively new. Prior to this, engagement with society was more often via teaching and the granting of degrees. Many governments now expect academics and universities to demonstrate precisely how they are relevant to the world outside academia (Morgan, 2014). This is where the wider benefits of academic research need to be shown, rather than assumed. In this environment, the money spent on academic research needs to be justified with more rigour than in the past. Welcome or not, this policy shift is consistent with efforts elsewhere in government and commercial spheres to measure return on investment.

In the global knowledge economy, governments are keen to ensure academic research remains relevant and produces useful impact. This is vital for maintaining economic competitiveness. All governments seeking to attain and sustain high living standards must now encourage linking of local economic activity to the global knowledge economy. Given this, promoting local research activity that is both excellent and relevant is an important political objective.

Assessments of research impact consider how research gains the attention and changes the actions of those outside the academy. Such impact could be technological, environmental, economic or social. It could affect the policies, strategies, and actions of businesses, governments, non-profit organisations, and community groups. It differs from impact within the academic community, such as scholarly influence and the citation counts of published articles.

The inclusion of non-academic impact into the processes of research assessment signifies a new phase in the auditing of academic work. Academic work will increasingly come to be judged and funded on its non-academic impact in addition to its academic value. This audit culture matters because it has consequences for the production of academic research. For example, Welch (2016) notes the subtle 'reshaping' and 'distorting' effects on Australian social science research of ever more sophisticated academic audits over the last 20 years.

The impact agenda has progressed over the last decade. This is evident in the funding and evaluation processes in some European countries, which have been adapted to incorporate the non-academic impact of research (Gunn & Mintrom, 2016). Various interventions are available to policy makers to assess the impact of academic research. They each interact with academic knowledge production in different ways (Gunn & Mintrom, 2017).

In Australia, the research impact agenda has intermittently progressed over the last 15 years and can be viewed across three periods: the Howard Government years (especially from 2001-2007), the Labor Governments (2007-13) and the Coalition Governments (2013-). We review each period in turn. In Australia, higher education policy is largely the responsibility of the Federal Government. Analysing policy-making at this level provides insights into the factors that have shaped academic research; although it should be noted that not all research is funded by the government and there are various other influences on the direction and content of academic research.

A review of the public policy history culminating in current endeavours to assess impact is useful for several reasons. First, it reveals how policy makers have wrestled with the challenge of measuring a phenomenon that may seem intangible. Second, it identifies the decisions that led to the current arrangements. This allows for reflection on what ideas have been proposed and abandoned and which have progressed. We can test for evidence of cumulative thinking. Third, it reveals political and ministerial choices that have shaped policy. It is particularly interesting to look at the motivations of ministers to explain policy goals and why some paths were not taken. Finally, it provides broader insights into the context and processes of higher education policy development in Australia – a complex space characterised by multiple, competing interests.

The Howard Government (1996-2007)

In 2001 the Liberal-National Coalition Government, led by Prime Minister John Howard, released the first in a series of reports that set the future direction of Australian research and innovation policy (Commonwealth Government, 2001). This was followed by reports including *Advancing Australia's Abilities: Foundations for the future of research in Australia* by the Australian Vice-Chancellors' Committee (AVCC, 2003) and *Backing Australia's Ability: Building our Future through Science and Innovation* (Commonwealth Government, 2004).

These reports created support for revising how research in Australian was funded and evaluated. One rationale for reform rested on the criticism of the research funding formulae operating at the time, which privileged quantity of publications produced and which 'was not providing the right incentives' (Sheil, 2014). The view was that such a system can be easily 'gamed' by researchers who respond by publishing more. This situation further fuels the 'publish or perish' culture which can be detrimental to research quality and a distraction from the pursuit of wider, non-academic impact.

In 2004, the minister with responsibility for universities, Dr Brendan Nelson MP, announced the pioneering Research Quality Framework (RQF), which would assess both the quality and impact of research in one framework. In September 2005 the Government unveiled the 'Preferred Model' for the RQF which detailed the structure of the assessment mechanisms and criteria (Department of Education, Science and Training, 2005). At this point, Australia was at the forefront of higher education policy design. The government was close to implementing a cyclical research evaluation process that would inform research funding allocations based on both university research quality (not just quantity) and its impact outside the academy.

The ground-breaking feature of the RQF was how it made impact an integral part of the cyclical mainstream evaluation of academic research. A non-academic impact component existed alongside this academic quality component. The RQF was ahead of its time and was in many ways controversial. It attracted several criticisms. The first was the high cost of its implementation. Some were concerned the high cost of the assessment process would take money away from actual research.

However, the main criticism of the RQF concerned the impact component. Criticism levelled at impact tends to fall into two categories. First is the argument that impact represents the imposition of non-academic interests onto the production of academic knowledge. This diminishes the purity of curiosity driven research and encroaches upon academic freedom and autonomy of 'the liberal university'. The second common criticism challenges

impact assessment on methodological grounds. Critics question the extent to which impact actually can be measured and assessed by an audit or evaluation; often claiming evaluation processes are a distraction with limited real positive social outcomes.

Following the Howard Government reshuffle of January 2006, Julie Bishop MP became the minister with responsibility for higher education. In November 2006 and after 'two fraught years of anxiety and speculation' (Armitage, 2006) the minister confirmed the RQF would commence in 2008. Bishop set out the reasons for the Government pressing ahead:

> 'The RQF is an important reform for Australian research as it will boost the production of high quality and high impact research and will give Australian researchers greater capacity to compete on the international stage. There is currently no comprehensive way to measure the quality or the impact of research conducted in Australian universities or the benefits to the wider community. The RQF will assess research against international benchmarks based on its quality and impact and will provide transparency about public investment in research ... Australia is also setting a pioneering course in the assessment of research impact. The introduction of a measurement of research impact in the RQF will create a world-first research evaluation measure.' (Bishop, 2006).

Policy was guided by the underlying assumption that the Government represents the public interest. Moreover, it was the duty of government to ensure academic research produced wider benefits; thus delivering a return on the investment made by taxpayers. Australian universities, it was argued, would also benefit from being more competitive on the global stage. However, the extent to which the Government can effectively represent the public interest in higher education has been debated. This is because there are a range of stakeholders in higher education, not necessarily fully represented by, or in agreement with, government policies.

The Rudd–Gillard–Rudd Governments (2007-2013)

The federal election of 2007 brought an end to the Howard Government, and the RQF. In the Kevin Rudd-led Labor Government, Senator Kim Carr took responsibility for higher education. One of Carr's first actions as minister was to cancel the RQF implementation, on the grounds there was no methodology or international recognised model to base it on. Research impact, Carr argued, would require universities to write long impact essays which would be difficult to assess by verifiable standards (Carr, 2007). As a replacement to the RQF, the Labor Government developed Excellence in Research in Australia (ERA), an evaluation program focused on academic excellence and the principle of peer review.

> 'ERA does not feature the controversial "impact" measure that was a feature of the RQF, involving lengthy, time-consuming, written descriptions. This would have eaten up researchers' precious time, as well as requiring detailed and painstaking attention on the part of assessors. The "impact" measure would have taken Australia on a path that led away from accepted international best practice – just when we need more than ever to ensure that our researchers have international standing.' (Carr, 2008)

The ERA was implemented and, with modifications, would go on to produce three full rounds of national evaluation by research discipline in 2010, 2012 and 2015 (Nicol *et al.*, 2016). The criteria within the ERA meant researchers could continue to be oriented towards their academic peers, rather than be required to consider beneficiaries of their research outside the academy.

Although the RQF would not be implemented in Australia, the global trend of governments redefining research policy towards the 'instrumentalisation' of knowledge and making universities more responsive to the needs of economic and industrial actors continued (Albert, 2003). In this process, the RQF proposal would prove to be valuable to policy makers in other countries. For example, the RQF heavily influenced policy makers in the United Kingdom (UK) who were developing the next generation of the Research Assessment Exercise. The funding council in England commissioned the report Capturing Research Impacts: A review of international practice (RAND Europe, 2009) to help policy development which featured the RQF as a source of 'policy transfer', where policy makers learn from comparable systems in other countries.

Although the impact agenda in Australia had stalled, it remained present on the political and policy landscape. For example, in 2011 the Focusing Australia's Publicly Funded Research Review noted the need for increased evidence of the broader economic, social and environmental benefits of publicly funded research and recommended that a feasibility study be undertaken on options for assessing them (Department of Industry, Innovation and Science, 2011). In 2012 the Excellence in Innovation for Australia (EIA) Trial, a substantial pilot by the Australian Technology Network involving the Group of Eight, was undertaken. This trial sought to measure the innovation benefits of research and act as a precursor to a possible future component in the national research

evaluation process informing the allocation of funding. Using case studies, the EIA trials revealed considerable non-academic impact across a wide range of university research disciplines (ATN & GO8, 2012).

Although it did not feature in the ERA, the impact agenda in Australia continued to develop through other activities of the Australian Research Council (ARC). In June 2013 a federal government discussion paper considering the wider benefits arising from university based research was published (DIICCSRTE, 2013). However, its release in the finally weeks of the Labor Government meant it was too late for any policy action.

The Abbott–Turnbull Governments (2013–)

The Liberal-National Coalition returned to government following the election of 2013, led by Prime Minister Tony Abbott. In October 2014 the Government revealed the Industry Investment and Competitiveness Agenda blueprint which argued that public research grants should prioritise research projects which are more relevant to industry, serve economic competitiveness and deliver business outcomes. The blueprint argued: 'Australia performs well on many measures of research excellence but cannot rely on research expertise alone. Our future prosperity depends on our capacity to turn research into commercial outcomes that lift innovation, help successful Australian businesses grow, and boost Australia's productivity and exports' (Department of the Prime Minister and Cabinet, 2014 p. xix). Reports such as this, which emphasise the need for a return on investment in research, reaffirmed the Government's position that publicly funded research is expected to contribute to innovation.

To inform future thinking, in July 2015, the Minister for Education and Training, Christopher Pyne MP appointed Dr Ian Watt AO to conduct a review of research policy and funding.

Following Malcolm Turnbull becoming Prime Minster in September 2015, Senator Simon Birmingham became the minister responsible for higher education. This marked a new direction in higher education policy, as many of the reforms attempted by Christopher Pyne were shelved. With a new minister open to new ideas, and the Coalition in office, the conditions for reviving the impact agenda were favourable. Birmingham indicated this in an address to the Business/Higher Education Round Table in November 2015:

> 'Unlike our Excellence in Research for Australia (ERA), the UK approach includes evidence of the impact of UK research, through its case study methodology. While there has been some criticism from the UK higher education sector of the administrative burden of the number of case studies that have been required, it should be possible to measure impact without making it overly burdensome. …. Sometimes we need to learn from the experience of others and adapt. Innovation and impact in rankings have the potential to tell a compelling story about our ability to transfer knowledge created in our universities to industry – about the economic and social impacts'. (Birmingham, 2015).

During the ten years since the RQF was proposed, the UK developed and implemented an impact agenda into its funding and evaluation model. For an Australian minister, it would now be easier to design a workable policy and build a consensus to implement it as the UK provided a fully worked out model. The UK benchmark indeed addresses some, if not all, of Kim Carr's impact concerns of a decade earlier.

The pace of policy change now quickened. In November 2015 the Watt Review published 28 recommendations (Watt, 2015) and in December the Australian Government announced the National Innovation and Science Agenda (NISA), which contained new measures to assist in improving the commercial returns of publicly-funded research. The NISA sought to encourage collaboration between universities and business, and to better translate research outcomes into economic and social benefits (Commonwealth of Australia, 2015). In March 2016 the Engagement and Impact Steering Committee, with supporting working groups, was formed 'to develop a process that uses clear and transparent measures of non-academic impact, and industry and end-user engagement, to assess our nation's university research performance and inform future funding structures' (Birmingham, 2016).

In May 2016, the minister responded to the Watt Review recommendations (Department of Education and Training, 2016), several of which were closely aligned to the NISA, and agreed to commission a national assessment of university research engagement and impact. The chair of the ARC then released a Consultation Paper detailing the proposed mechanisms and criteria (Australian Research Council, 2016a). The Paper made reference to the impact component of the UK's Research Excellence Framework (REF) – revealing two-way policy transfer, with Australia now learning from the UK experience.

In November 2016, with the consultation completed, Senator Birmingham confirmed pilots would take place in 2017 to measure the impact of university research and their engagement with business and industry. He said the pilots were about 'testing how we can measure the value of research against things that mean something, rather than only allocating funding to researchers who spend

their time trying to get published in journals' (Birmingham, quoted in Australian Research Council, 2016b).

The Engagement and Impact (EI) Assessment pilots involved a selection of ten broad discipline groups being tested for either the 'engagement' or 'impact' component of the assessment. Participating universities made their pilot submissions to the ARC in May 2017, which were assessed throughout June by five panels comprising of academics with specific discipline expertise, industry representatives and other end-users of research. Almost 300 submissions were made by the 39 universities who participated, generating extensive data. The panels provided a rating and feedback on each unit that universities submitted. Following this, the methodology tested in the pilot, as well as data and feedback from the experts and universities involved, were reviewed to inform the design of the first full assessment. The national rollout of the EI assessment will be undertaken as a companion to the 2018 round of the ERA (Commonwealth of Australia, 2017).

For the purposes of the pilot, research engagement is defined as the 'interaction between researchers and research end-users (including industry, Government, non-governmental organisations, communities and community organisations), for the mutually beneficial exchange of knowledge, technologies and methods, and resources in a context of partnership and reciprocity'. This is assessed by metric indicators and a narrative statement. Alternatively, research impact 'is the contribution that research makes to the economy, society and environment, beyond the contribution to academic research,' to be assessed by qualitative information (impact studies) supplemented with quantitative data, where available (Australian Research Council, 2016c).

This distinction highlights the novelty of the new Australian approach. The UK system, for example, is only concerned with impact. Considering engagement and impact as two distinct entities disentangles two different, but obviously related phenomena. These clear demarcations between interactions with the 'non-academic world' (engagement) and non-academic benefits that can be identified and verified (impact) help communicate what does, and what does not count, in the evaluation. Moreover, considering both, means the evaluation captures a wider range of academic activities. It may also mitigate for Australian researchers some of the confusion UK researchers first experienced understanding the UK impact agenda. The absence of an engagement element in the UK system, and the initially narrow definition of impact have been a source of frustration and an area for potential future policy revision.

It must be remembered that engagement and impact are not the same thing. The experience of the UK, and the responses to the consultation paper, show that they are often viewed differently. Academics are perhaps more amenable to engagement, seeing this as an acceptable addition to their work; whereas impact can be met with hostility.

For example, the Australian Academy of Technological Sciences and Engineering (ATSE) response to the consultation highlighted the difficulties in assessing research impact, as opposed to engagement. Their submission argued that attempting to measure impact involves long time lags and a diversity of indicators across disciplines. They concluded: 'While it is only readily possible to "assess" research impact, research engagement can be "measured". ATSE has strongly recommended that the proposed NISA process focus primarily on research engagement, not impact' (ATSE, 2016b).

This difference between engagement and impact relates to another fundamental methodological debate. This is also evident in responses to the consultation paper, where it asked: 'If case studies or exemplars are used, should they focus on the outcomes of research or the steps taken by the institution to facilitate the outcomes?' (Australian Research Council, 2016a p. 8). In other words, should the evaluation focus on the 'ends' or the 'means' of achieving engagement and impact? Responses to this varied. For example, the Australian Academy of the Humanities (AAH) expressed concern with a focus on the outcomes as 'causality and attribution are notoriously difficult to pinpoint', while advocating a focus on 'facilitation processes would not only be more manageable, but, importantly, it would also serve to highlight the distinct stages of research pathways to impact: result of research process; outcomes of research; and coverage of the research' (AAH, 2016). The submission by the Early and Mid-Career Researcher Forum of the Australian Academy of Science also endorsed a focus on facilitation processes as it would be easier to implement because immediate data can be collected. They also argued such an approach would overcome time lag issues and improve incentives (EMRC AAS, 2016).

While this focus on the 'means', and not the 'ends', of engagement and impact may be easier to assess, others have argued research evaluation must be consistent and robust. For example, a learned society of mathematicians pointed out the 'ERA measures outcomes so this assessment process should only measure outcomes too' (AMSI *et al.*, 2016). Further methodological weaknesses were highlighted by the Australian Sociological Association

(TASA) who 'are concerned that focussing on "steps taken by the institution" could be more susceptible to gaming and manipulation and could result in superficial measures of impact. By contrast steps taken by researchers to create impact would be useful to capture in the assessment' (TASA, 2016).

Although a nurturing environment that fosters impact and engagement is of importance to their realisation, an assessment of the presence of such an environment does not measure actual outcomes. Moreover, although engagement may be regarded more favourably by academics, it may not produce the substantiated benefits of impact. Returning to first principles, the objective of government policy is to see a return on investments made. This requires verification there are outcomes, not just processes. It is for this reason the UK research evaluation and funding systems has focussed on impact.

These debates illustrate the complex design considerations and methodological choices facing higher education policy makers. They also highlight the differing positions taken on the best way forward by different parts of the sector. It reinforces the need for the pilot year. The pilot year provided an opportunity to test the robustness of a wide range of indicators and methods of assessment. It also has increased the likelihood that the right balance will be found between metrics and peer review, therefore addressing the concerns of organisations including the Australian Technology Network (ATN, 2016). This is important, as Universities Australia has noted: 'As impact can only be subjectively assessed rather than objectively measured, as is the case with engagement, it is essential that the assessment criteria is (sic) robust and transparent' (Universities Australia, 2016).

The pilots have also mitigated a criticism made of the ill-fated RQF – that the Government was implementing a potentially burdensome and expensive new assessment system in the absence of any pilot data to demonstrate its advantages and justify its costs (Shewan and Coats, 2006 p. 465). The pilots can also be viewed as a way for the sector to 'take ownership' of and 'co-develop' the reforms. Here, the Government can be seen as paying respect to the 'self governing' status of institutions of higher education. Piloting and engaging with the sector also increases the likelihood that the fully-implemented system will work as intended.

Conclusion

The meandering political process driving the implementation of research impact assessment highlights the contentious nature of higher education policy making in Australia. It also reveals the difficulty of designing an audit mechanism that is valid and that encourages researchers to take an interest in enhancing the impact of their work beyond the campus. The greatest policy challenge has been agreeing to a methodology and building a political consensus around it.

The controversy and methodological challenges associated with impact assessment have ramifications for realisation of a fully-functioning assessment system. For government ministers, building a political consensus, both within and outside parliament, for such a system is difficult as it is often met with resistance. For policy designers and public managers developing a system, efforts must be made to ensure it is robust, credible and acceptable to a substantial portion of the academic community.

As the assessment of impact and engagement is rolled out across Australian higher education in 2018, it will be instructive to monitor future developments within the debates set out here. As one long and winding process reaches its end, others are only beginning.

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