Charles Sturt University

Policy Review of the National Competitive Grants Program

13 May 2024

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Office of the Deputy Vice-Chancellor (Research)

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By email: ARC-PolicyReview@arc.gov.au

Dear Dr Johnson

Policy review of the National Competitive Grants Program

Thank you for the opportunity to contribute to the revitalisation of the National Competitive Grants Program (**NCGP**).

Charles Sturt University suggests that a revamped NCGP should support broad research capacity and capability across a range of disciplines and in diverse locations; promote greater access to research findings, outcomes and outputs; embedding cross-disciplinary and cross-sector collaboration as a core requirement for large-scale and longer-term grants; and have a strong focus on equity in both its administrative processes and in funding outcomes.

These goals could be achieved by the NCGP having fewer, more flexible programs including dedicated support for early career and Indigenous researchers. More flexible programs would accommodate a broader range of research activities in a broader range of settings than has increasingly been the case with competitive grants. Flexible programs could include targeted or thematic rounds and provide a way to respond quickly to emerging opportunities or challenges.

The University also suggests that the NCGP should embrace experimentation and innovation in grant application, assessment and reporting procedures, with new methods trialled on smaller grants and programs and, if shown to be effective, scaled up to other programs. This would encompass cautious testing of the potential of artificial intelligence systems.

Our key point, however, is that the NCGP must be viewed and reviewed as part of a wider Australian research policy and funding system. The NCGP should serve primarily as a vehicle for supporting the beginning of the research pipeline, producing the new ideas to be developed, applied and commercialised with support from the private and not-for-profit sectors and other Australian and state government programs. Moreover, the NCGP cannot and should not alone be expected to drive a more diverse and inclusive research system, embed First Nations knowledge in Australian thinking, or drive more collaboration: these should be core goals for all Australian Government research programs, and to that end we would like to re-state our support for a whole-of-system review of Australian research policies and funding, as recommended by the final report of the Australian Universities Accord. While such a review is outside the scope of the current consultation we believe the ARC can have a critical role in ensuring it happens, and that future investment in research produces the best possible outcomes for the country.

Yours sincerely

Professor Mark Evans
Deputy Vice-Chancellor (Research)

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General comments

Charles Sturt University is Australia's largest regional university and one of its largest providers of online education. We are a unique multi-campus institution based in some of the country's most vibrant regional communities, with campuses in Albury-Wodonga, Bathurst, Canberra, Dubbo, Goulburn, Orange, Port Macquarie, and Wagga Wagga. All have strong connections to surrounding rural and remote communities and employers. In 2021 the University had more than 40,000 students and approximately 2,000 full time equivalent staff.

Research is a fundamental part of Charles Sturt University's identity and mission. The University's roots stretch back to the establishment of the Wagga Experiment Farm in 1892. A few years later it also became a teaching institution, and, in time, an agricultural college (1948), a research institute (1954) and eventually a university.

Research at Charles Sturt encompasses many fields, including, for example:

- captive breeding of endangered native species,
- security, terrorism, and the risks posed by right-wing extremism,
- optimising nutritional outcomes from the use of breast milk alternatives,
- turning discarded human hair into graphite with potential use in energy storage and drug delivery technology,
- First Nations ways of being, doing and knowing and
- world-leading research in speech pathology.

Charles Sturt University has, quite frankly, achieved these successes despite higher education research funding policies and programs that see the vast majority of block grants, and competitive funding flow to large metropolitan universities. Most of Australia's current university research funding arrangements are based on track record and other trailing indicators, volume, and, increasingly, capacity to attract income from non-government sources. In addition, short-term funding horizons, underfunding of projects, lack of funding for research infrastructure, and the need to expend time and effort on the uncertain outcomes of competitive funding programs are all conditions that favour universities able to subsidise their research activities with income from other sources, such as endowments, legacies, and the income from international student fees.

Further, the policy and funding settings for public funding for research mean that basic or 'blue sky' research – especially in the humanities and social sciences – is increasingly concentrated in these universities, limiting the opportunities for many postgraduate students and leading to a lack of diversity in the perspectives brought to bear on fundamental questions, a situation that does not bode well for the Australian Government's hopes to embed First Nations knowledge and knowledge systems in the nation's research system nor to increase our collective understanding of country. In fact, it is impossible to truly understand country if the majority of funds flow to limited geographic regions in metropolitan centres.

With these issues in mind, Charles Sturt University's submissions to the Australian Universities Accord and the review of the *Australian Research Council Act 2001* emphasised the need for targeted investment in research in regional settings, to:

- build and maintain research capability in regional areas,
- make part of the competitive funding schemes exclusively available to regional universities, possibly through targeted rounds,
- provide the new knowledge, ideas and technologies needed by regional employers and communities,
- leverage regional research organisations' local networks and local knowledge in tackling local, regional and national challenges, and
- ensure that regional students have the opportunity to undertake postgraduate research degrees.

We also argued for greater certainty in research funding over time, for example through longer-duration grants, and policy and funding arrangements that favour collaboration over competition. We also suggested

that introducing a requirement for large-scale research projects to include at least one regional partner would bolster national capabilities and ensure nation-wide benefit from public investment.

In relation to the ARC specifically, Charles Sturt University recommended that the Government re-establish the ARC Board and mandate at least one member from a regional area – an essential step if the organisation is to reflect the breadth of Australia's research system and support a research system that delivers economic, social, environmental, and cultural benefits for Australia. We were very pleased to see that both the review panel and the Government accepted this recommendation and have responded accordingly. It is recognition of the need to ensure that the policies underpinning Australian research programs delivers those benefits for *all* Australians.

We also recommended that the ARC should:

- operate independently of government,
- rely primarily, if not solely, on expert advice in funding decisions,
- focus on fundamental research across a range of disciplines (excluding those under the remit of the NHMRC),
- explore different models for assessing funding applications, including new approaches to peer review that are less resource- and time-consuming for the reviewers and less likely to delay funding decisions,
- likewise, explore options to reduce the administrative burden around applying for ARC grants and reporting on progress and outcomes,
- encourage researchers to provide plain English summaries of their proposals, notwithstanding the need for the use of technical language in some cases,
- benchmark its administrative and peer review process, outcomes and impact against other Australian and international research funding bodies,
- give careful consideration to how First Nations knowledge is used in grant applications, research evaluation, and public reporting,
- establish or support publicly available and searchable data sets, case studies, publications repositories and other information sources for research funded by the ARC, and
- provide leadership in research evaluation and shaping the national research system.

The submission below expands on these ideas and suggests how they could be reflected in the policies and principles underpinning the NCGP.

Response to consultation paper questions

1. What are the best guiding objectives for the NCGP to support excellent pure basic, strategic basic and applied research that will enable it to deliver economic, social, environmental, and cultural benefits for Australia?

Guiding objectives for research supported through NCGP:

- Support broad research capacity and capability – broad both in disciplinary and thematic spread but also geographically, to ensure the outcomes and benefits flow to all Australians.
- Accessibility, through open access and open data arrangements, use of DOIs, plain language and clear and simple terms of use.
- Equity in assessment, ensuring the best proposals are funded, rather than just proposals by those with the strongest track record.

2. How can the NCGP further support and encourage:

a. high-calibre research that drives the advancement of knowledge?

'High-calibre' is too vague a term for appropriate use here. It connotes a strong focus on outcomes and end results rather than, for example, high quality research processes (i.e. methodologically robust). An emphasis on 'high-calibre research' and researchers has often, in the past, meant ignoring or forgiving poor research cultures and lack of attention to research integrity.

The NCGP should support research that drives the advancement of knowledge. This should be its core goal. That research should be characterised by strong research methods, effective use of resources, transparency and accessibility, innovation, inclusiveness, a commitment to developing the next generation of researchers, good communication about the project and its results, and alignment with national priorities and goals as well as global challenges.

The NCGP can support and encourage such research by:

- Articulating an appetite for risk – to enable the support of highly innovative research that significantly advances knowledge, rather than only research that makes incremental advances,
- Reducing the assessment weighting on researcher capability and increasing weighting on project quality/innovation, especially for Discovery and ECR schemes.
- Providing clear, easily-understood information about application and assessment processes, as peer review is not well-understood outside the research sector and this can lead to perceptions that funding decisions are made arbitrarily or driven by cronyism and ideology.

b. the utilisation, translation or commercialisation of research to deliver benefits to Australia's society, economy, and community?

When the NCGP was established there were few research translation, commercialisation, and industry linkage programs in Australia, at either the state or national level. Those that did exist, such as the CRC program, generally excluded SMEs and emerging technologies and fields of research. The Linkage scheme was created in part to address this gap.

The ensuing decades have seen much more attention on research outcomes including commercialisation, and the creation of many new programs, large and small, intended to turn research into new products and other commercial outcomes. The Trailblazer Program is the most recent example.

The number and range of research utilisation, translation or commercialisation programs now operating in Australia means that there is no need for the NCGP and the ARC to to fund projects intended to push ideas up the Technology Readiness Level scale. The NCGP should instead focus on ensuring that there is a good supply of 'feed stock' for other programs: new ideas, IP, talented researchers and innovators, and a strong research and innovation culture.

A further argument against the NCGP supporting commercialisation as a primary outcome is that it is typically an expensive and high-risk proposition which is best funded with industry co-investment to ensure

market adoption issues are considered. The basic rule of thumb is that the progression from basic research to experimental development to application involves a tenfold increase in costs for each step, and every high TRL project supported by the NCGP means fewer projects to feed the pipeline.

A key consideration here is the NCGP's position and role in the wider national research policy and funding framework. Many submissions to the Australian Universities Accord, including Charles Sturt's, advocated the development of a national research strategy that could better coordinate research activities and funding across government and around the country. The Panel accepted these suggestions, and the final report recommended (Recommendation 24):

- "a formal strategic, cross-portfolio examination of national research funding with a view to increasing Australia's capacity to maximise Australia's R&D competitiveness for economic gain, and environmental, cultural and social good."
- "a multi-agency government strategy that sets medium and long-term targets for Australia's overall national spending on R&D as a percentage of GDP, requiring a significant increase to ensure Australia fully utilises the potential of its research sector and, consequently, competes more effectively in the global knowledge economy."
- "additional business and government investment in research", and
- a root and branch consideration of the suitability and sustainability of the national research funding and governance architecture."

Charles Sturt University supports this recommendation. We believe this work would reinforce the need for the NCGP to be focused on pure basic, strategic basic and experimental development research – the beginning of the research pipeline.

In this context it is worth noting that as long ago as 2007 the Productivity Commission found in 2007 that "There are risks associated with the continuing diversion of public funding to applied science and innovation activity at the expense of basic and strategic science and innovation." ('Public Support for Science and Innovation', Finding 9.3). In that report the Commission estimated that about half of all Australian Government research funding was for basic research, a proportion that has fallen since then to around 40%. The preferencing of commercial outcomes over basic research is a policy decision with significant implications for national capabilities.

3. How can the outcomes, impact and contribution of NCGP funded research be best identified and communicated?

The Australian Universities Accord recommended "the creation of a National Research Evaluation and Impact Framework that is data driven" (Recommendation 29). This recommendation came despite the concerns expressed across the sector – including by Charles Sturt University – that data-driven processes for assessing research outcomes and impact will disadvantage some fields of research (including emerging fields) and overlook common research activities for which there is little or no relevant data. The latter concern covers many entrepreneurship, communication, engagement, and partnership activities, including, particularly, those involving First Nations peoples. Data-driven or metrics-based evaluation should form only part of the NCGP and ARC framework for research evaluation and impact.

That said, the development of useful data is an option, though this will take time, money, and careful testing. Based on other Accord recommendations and the government's response this is likely to be a task that falls to the proposed Tertiary Education Commission. This could be a positive development: if the Commission is established in the form proposed by the Accord Panel then joint work by the ARC, TEQSA and other agencies could produce a framework suitable for all Australian Government research programs, in policy and performance standard setting, and possibly in allocating some funding.

Ideally, such a framework would encompass:

- a broad spectrum of impact, including societal, policy, clinical practice, professional practice, and research outcomes (that is, research that has an impact on other or further research – essential for evaluation of 'blue sky' research) as well as knowledge translation and commercial outcomes,

- examination and adaption of best practice in international models including the UK Research Evaluation Framework, the NZ Performance-Based Research Fund, the Advancing Research Impact in Society, and the Research Impact Canada models,
- supporting communities of practice in knowledge translation and impact, both within and between universities,
- a flexible approach that considers the work of individual researchers as well as research teams, and ECRs as well as more established researchers,
- a cost-effective methodology that does not divert resources (and funding) away from actual research, and
- clear communication of the results, in formats and language accessible for a wide range of uses and users (in line with Recommendation 29d of the Australian Universities Accord final report).

The immediate priority is for clarity around what approach is to be used while this work is going on, so that universities can evaluate their own performance and make informed decisions about their research strategies.

4. What structure and design of the NCGP would:

a. best support the NCGP's objectives?

The number of programs encompassed by the NCGP has steadily increased since the foundations of the overarching program were put in place. This has in turn led to increasing operational costs for the ARC and an increasing administrative burden on universities. A few more flexible programs would provide a simpler and more cost-effective way to support the NCGP's objectives, meet evolving future needs, and respond to emerging challenges or priorities.

Charles Sturt University suggests that the NCGP should be re-formed to comprise at most four programs:

- a Discovery-like program to support pure basic and strategic basic research, with the potential for projects to include but not focus solely on experimental development,
- a Linkage-like program to support collaborations with non-university partners and research end-users,
- a dedicated program for Indigenous research and researchers (though any project under any program could involve Indigenous research and researchers), and
- a dedicated capacity-building program for early and some mid-career researchers (though any project under any program could involve ECRs) which may also extend to research training.

Rather than operating a separate infrastructure program like LIEF, the NCGP could provide support for infrastructure under any program (noting that there is a dire need for renewed investment in research infrastructure beyond the capability of the NCGP to meet).

Any of these programs could involve special rounds or one-off sub-programs based on specific themes, priorities or challenges.

b. reduce complexity and deliver grants more efficiently?

The introduction of a two-step application process for some grants is welcome, though there are early indications this is not necessarily reducing the administrative burden on researchers. Fewer and more flexible programs could support some experimentation in application, assessment, evaluation, and reporting requirements, including for example, a streamlined approach for smaller grants. If these alternative approaches prove to be effective they can be applied to other programs.

There is also scope to reconsider the administrative and reporting requirements to the NCGP. These have steadily increased over time, with some, like the 'National Interest Test', introduced for political reasons, and others adding no value to the process. The NCGP is long overdue for a thorough pruning of the administrative thicket. There are grant administration and delivery models overseas and within Australia that could be considered. In our submission to the review of the ARC Act Charles Sturt University noted that there are other Australian Government research programs which use peer review and award funding at a similar level to most ARC grants – if not more – yet involve far simpler application and assessment

processes and much faster decision times, all while meeting the core requirements for accountability in use of public funds.

c. rebalance risk settings to encourage frontier basic research with potentially transformative outcomes?

Experimenting with application and assessment processes and more flexible programs would help here, too. For example, less emphasis on researcher track record (including more traditional research outputs) would encourage more 'blue sky' thinking, though such an approach might need to be complemented by drawing on a wider pool of assessors and some fresh blood in the College of Experts.

d. set the right balance between different scheme types and duration?

There is no 'right' balance between different schemes, project lengths, or size. A more flexible NCGP can be responsive to the needs of researchers, trends in research, emerging opportunities and challenges, and government and national priorities without trying to steer things towards an illusory and unhappy medium.

The NCGP framework could include some sub-programs, perhaps for smaller grants, that are always open to applications.

e. use peer review in the most effective way?

The NCGP could experiment with different models of peer review including, for example, assessing proposals on potential rather than track record, discussed below, or assessments based on de-identified proposals ('blind peer review'). This would also involve changes to the training and advice provided to assessors, with the benefit of helping to increase their appetite for 'risky' or innovative in research projects.

To the same end, the NCGP could consider using a wider pool of peer reviewers, such as researchers in industry and government, think tanks, independent research institutes and other organisations.

f. leverage the opportunities and manage the risks of using artificial intelligence?

The evidence currently available indicates that artificial intelligence is not yet at a level or reliability and sophistication that it can be a substitute for peer review or used in research evaluation exercises without significant human oversight. Like many other early-stage ICT applications its principal merit seems to be speed rather than quality.

For example, a recent study found that AI-assisted peer review of papers submitted to a machine learning conference tended to produce higher scores than human review, and that this in turn increased the probability of a paper being accepted ('The AI Review Lottery: Widespread AI-Assisted Peer Reviews Boost Paper Scores and Acceptance Rates', DOI: 10.48550/arXiv.2405.02150). The findings suggest AI-assisted reviews can reduce the reliability of and trust in the peer-review process and highlight the need for clear guidelines and disclosure requirements around the use of AI. At a minimum applicants should be transparent about whether or how they have utilised AI tools when preparing proposals, as funding organisations (or publishers or conference organisers) should be about their use in assessing proposals. For some kinds of grant proposals it would be appropriate to continue to prohibit the use of AI at any stage of the process.

Additional measures may be needed to validate the quality and objectivity of AI-assisted approaches, not least because algorithmic bias remains a significant problem. A balanced approach could help leverage AI's potential to improve efficiency and thoroughness of applications, while mitigating risks. For example, AI could provide an initial draft that a human reviewer then carefully assesses, edits and takes responsibility for.

Thinking again of the NCGP as part of an ecosystem, there would be merit in the Australian Government supporting on-going research on the prevalence, methods of use, reliability, cost, and impacts of AI in research, including in funding decisions. The findings from this research can inform evidence-based policies for use across the whole ecosystem. Ultimately, though, human judgment should remain the core of the process, with AI as an assistive tool. Clear norms and standards for that human-AI interaction also need to be developed and implemented.

5. ***How can the NCGP best support collaboration between disciplines (between and across HASS and STEM) among researchers (both national and international), across sectors and funding programs?***

As with larger and longer duration grants, industry linkages, knowledge transfer and administrative efficiency, greater collaboration across disciplines, sectors and programs has been a goal of the NCGP since its inception. Its success in achieving these goals has been mixed, with progress often compromised by external factors. What STEM researcher or industry partner would collaborate with a HASS researcher or research group if they felt it would decrease their chances of success, or open their work to mockery in parliament and the media?

One relatively simple way to overcome this challenge and encourage more collaboration would be to make cross-disciplinary and/or cross-sectoral engagement a requirement for large-scale, high value or long-term research projects, such as Centres of Excellence. This would help establish collaborative research as the default rather than the exception.

6. ***How can the NCGP promote a strong and diverse research sector, including through supporting research training and opportunities for early career researchers, women researchers and other under-represented groups?***

As with collaboration, building capability and a more diverse and inclusive research system should be a 'baked in' characteristic of the NCGP and all its constituent programs. Proposals could be required to show how they will support research workforce diversity and career development, with appropriate KPIs and reporting arrangements (for the project and for the funding body).

Participation by under-represented groups and other major or persistent gaps could be addressed through targeted rounds, ideally as part of a whole-of-system effort. This extends to maintaining and bolstering research capability in regional settings, ensuring that regional communities and businesses have access to new ideas and can partner with leading researchers; that some of the nation's research effort is directed at region al needs and challenges; and that regional students have the opportunity to go on to postgraduate research degrees and develop the creative, entrepreneurial and analytical skills needed for the future.

One way to achieve many of these goals would be to award some grants on the basis of potential rather than track record, as suggested in Charles Sturt University's submissions to the Accord. This is not radical or unprecedented: the US NIH providers advice to reviewers on assessing researcher potential for some grants (R01) and is looking to adopt a similar approach for others (NIH, Proposed Reviewer Guidance and Application Instructions), and several UK schemes aimed at ECRs have considered potential rather than track record (Nigel Thrift, *Research Careers in the UK: A Review*, 2008). It is also part of the Science Europe 'Vision for Future Recognition Systems' (DOI: 10.5281/zenodo.7858100) and was identified (more than 10 years ago!) as good practice by the League of European Research Universities (LERU, *Harvesting talent: strengthening research careers in Europe*, January 2010).

7. ***Are there aspects of the NCGP that could be strengthened or redeveloped to advance support for:***

a. ***Indigenous Australian research, incorporating Indigenous knowledge and knowledge systems (where appropriate)?***

b. ***Indigenous researchers, irrespective of their areas of research?***

This too needs to be considered as an issue and a goal needing systemic effort. The draft National Science and Research Priorities propose that First Nations knowledge and knowledge systems should inform and underpin the high-level priorities and objectives of the research system. The final priorities will provide some concrete advice on how this can be achieved and ensure that the NCGP is part of a concerted national effort to bolster Indigenous research and researchers, including immediate efforts to boost the number of Indigenous PhD students.

As a starting point the NCGP could follow the lead of the NHMRC in adopting a target for investment in Indigenous research, Indigenous researchers, and Indigenous-led projects, as well as ways to accommodate non-traditional research outputs.

The NCGP also needs to consider some of the challenges unique to Indigenous research and to working with First Nations peoples. In a recent column for *Future Campus,* Deputy Vice-Chancellor (Indigenous) at the University of Melbourne, Professor Barry Judd, highlighted that such research can involve higher costs for travel, accommodation and living expenses when compared to similar projects involving non-Indigenous Australians (Research vital in closing the gap beyond city limits, 7 May 2024). He also notes that:

Calibrating funding cycles for grants with the time it takes to build relationships and engage in co-production is key to strengthening Indigenous research. Current ARC grants timeframes are not aligned with the time it takes to develop relationships, engage in co-production and deliver meaningful outcomes to communities.

These factors need to be kept in mind when designing programs.

8. In the context of other government funding for research and development:

a. How should the NCGP promote an appropriate balance of basic and applied research?

There is no consensus on the appropriate balance between basic and applied research, though as noted above there are strong indications that in Australian the balance of funding has swung strongly toward the latter. It has been left to universities to maintain Australia's basic research base (for want of a better way of putting it), in many cases without reliable public funding.

In the short to medium term, and again noting that the NCGP is only part of the national research funding system, it might be appropriate for the NCGP to favour basic over applied research to return some balance to the system and to ensure that core capabilities, knowledge, experience and resources are not lost.

b. How can the NCGP improve its connectedness to the research ecosystem to help progress the research it funds further along the pipeline towards translation and impact?

As noted above, the place of the NCGP within the wider research ecosystem has evolved over time as new programs have been established, as policies and guiding frameworks like the National Science and Research Priorities have been put in place, and as methodologies in research and research communication have changed (consider the impact of ICT and open access on research practice).

Moreover, the NCGP is now part of a much larger and diverse research ecosystem than was the case when it was established. There is, however, little coordination across the system and considerable overlap (if not duplication) across programs. The interconnectedness of the NCGP across this system can only be enhanced by the kind of systemic review and whole-of-government strategy recommended in the Accord, a process that should begin with recognition that the main role of the NCGP is to support pure basic, strategic basic and experimental development research, build national capabilities and develop the research workforce – though those these responsibilities should not rest with the NCGP alone.

A related concern is that the NCGP in its current configuration does not allow enough flexibility for co-investment with other funding programs (state and Commonwealth). This is partially the result of constraints imposed by the Commonwealth Grants Rules and Guidelines that may not be a good fit for research as distinct from other activities supported by Commonwealth grants. Co-investment can be seen as a way to leverage limited funding for research, build scale, promote better coordination across government and different programs, and achieve one of the other recommendations of the Accord (and many other reviews of Australian research): full cost funding of research projects.

9. How should the NCGP be structured to best support and deliver on national research priorities, as they evolve over time?

An NCGP with fewer, more flexible programs as described above, and including thematic rounds, would be able to support and deliver on national research priorities without the need for specific programs, funding targets, exclusion of some disciplines or kinds of research, or diminishing capacity and capabilities in the research system as a whole.

This flexibility could provide for a kind of ‘rapid response’ capability, to quickly mobilise R&D efforts to deal with local, regional or national emergencies. The COVID-19 pandemic is an obvious example, but there is also a clear need to be able to respond to more localised emergencies like floods and fires, crop or animal disease outbreaks, and biosecurity incursions. Again, stronger research capabilities outside the major metropolitan would ensure that the nation can respond to these challenges when and where they emerge.

Moreover, the NCGP is not the sole vehicle through which the Australian Government can support research on national priorities – the NCGP’s place in the wider Australian Government research ecosystem needs to be considered here, too.