



Australian Academy of Science

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Committee Secretary
Education and Employment Legislation Committee
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By email: eec.sen@aph.gov.au

Dear Secretary,

The Australian Academy of Science (the Academy) welcomes the opportunity to comment on the inquiry into the Higher Education Support Amendment (Job-ready Graduates and Supporting Regional and Remote Students) Bill, being held by the Senate Standing Committee for Education and Employment.

Job-readiness comes first and foremost from a good education.

Graduates need to not only be prepared for the jobs of the present, but must also possess the flexibility of mind, resilience and ability to adapt their skills or learn new skills, so that they are prepared for the jobs of the future.¹

Scientific knowledge and skills are vital to Australia's future because they underpin so many current, emerging and future jobs. Whether it's the quest for a COVID-19 vaccine, the emergence of artificial intelligence or the challenges of adapting to climate change, scientists worldwide are working side-by-side with colleagues of other disciplines and in industry to come up with the solutions to the problems our world faces.

Australia should strive to produce science, technology, engineering and mathematics (STEM) graduates that are not only ready to fill jobs, but who also understand how to create jobs. Ensuring that the next generation of Australian researchers is adequately trained, with expertise crucial to our national interest, and that we have access to the infrastructure needed to conduct research will safeguard Australia's economic future.

To have a substantial impact on uptake rates of STEM courses at university level, measures must apply at a much earlier stage than when students apply to undertake higher education. Whilst this inquiry focuses on measures primarily impacting the higher education sector, it must be acknowledged that engaging and inspiring STEM education at a primary and secondary school level is a crucial driver of future interest in STEM study and employment.

The Academy recommends that the Committee:

- Considers the implications of the structural reduction in public funding for undergraduate education, and Australian universities, as a result of the provisions of the Bill which shift the balance from 58 to 52 per cent contribution from the Australian government per student place.

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- Suggests amendments to remove the perverse incentive for universities to enrol fewer STEM students because of the changes in cluster funding arrangements
- Notes the importance of a deep and broad education for every undergraduate. In that light, we suggest that STEM students engaging in subjects in humanities and social sciences, or other disciplines should be subject to the STEM student contribution rates
- Supports the provisions in the Bill allowing Commonwealth Supported Places to cover work experience units
- Legislates a floor for research funding, equity funding and the National Priorities and Industry Linkages Fund (NPILF), not a maximum.

Reduced resources and perverse incentives for STEM

The current design of the Bill risks creating perverse incentives for universities to enrol fewer STEM students, as the provisions in the Bill ask universities to educate more new science students from 2021, for less funding per student.

The changes to student contribution rates reduce loan amounts for Australian students undertaking a science degree or science subjects as a part of an undergraduate degree. However, they also decrease the Australian Government's contribution, leading to an overall decrease in the amount of funding per student universities will receive for science and engineering.

Unless this is addressed directly either through amendments to the legislation or through the detailed design of the National Priorities and Industry Linkage Fund, this would be an undesirable public policy outcome.

There is a lack of evidence to suggest that fee rises of the magnitude proposed, or modest fee decreases, have any discernible or lasting impact on student demand for different disciplines.

Historically, there has been little precedence that student demand is materially affected by changes in fee levels, given that price signals are counteracted mainly by Australia's income-contingent loans system.²

As the table below indicates from 2021, universities will receive less funding per non-grandfathered students in a range of scientific fields:

Discipline Cluster	2020 Funding rates			2021 Funding rates			Difference
	Student Contribution maximum	Commonwealth contribution amount	Total	Student Contribution maximum	Commonwealth contribution amount	Total	
Science	\$9,527	\$18,920	\$28,447	\$7,950	\$16,250	\$24,200	-\$4,247 -17.5%
Engineering	\$9,527	\$18,920	\$28,447	\$7,950	\$16,250	\$24,200	-\$4,247 -17.5%
Mathematical Sciences	\$9,527	\$10,821	\$20,348	\$3,950	\$13,250	\$17,200	-\$3,148 -18.3%
Environmental Sciences	\$9,527	\$24,014	\$33,541	\$7,950	\$16,250	\$24,200	-\$9,341 -38.6%

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The basis for these reductions is a Deloitte Access Economics report, *Transparency in Higher Education Expenditure*, commissioned by the then Department of Education and Training.³ In the latest iteration of this study, up to 32 of the nation's 42 universities participated. Senators will need to consider whether this report is sufficient basis for the change in funding outlined in the Bill.

The Academy is concerned about the reduction of resourcing for many scientific disciplines. The nature of the changes will impact science disciplines in different ways. The Academy is concerned that the Bill takes a one size fits all approach to the cluster funding of science. In particular, we note the finding in *Transparency in Higher Education Expenditure* that research-intensive universities are likely to have a higher cost basis than other universities.

Science will solve it, but not alone

Students must be encouraged when selecting subjects to study, to undertake as broad a curriculum as possible. While the Bill reduces the loans amounts students will incur undertaking science and mathematics, the measures must not cause unintended consequences.

The Australian Academy of Science stands with the nation's other learned academies in expressing concerns that the announced package demeans non-science based academic disciplines. Our society needs scientists, but it would be poorer if not for people educated in the arts, social sciences, management, commerce, law and the humanities.

Scientists know that all knowledge, however specialised, is multidisciplinary. A system that silos knowledge and values one sort of knowledge over another will fail Australians.

Securing the future of scientific research

The assumption that underpins both the Job-ready Graduates Package and the Bill is the idea that university teaching and research are separate, independent activities. This is not the case. Teaching and research are deeply interconnected, with the delivery of a high-quality university science curriculum reliant on research, and high-quality research reliant on research training.⁴

The changes proposed in the Bill effectively removes the cross-subsidy required to fund the indirect costs of research not covered either by the Research Block Grants, nationally competitive grants or industry income. Up until 2004, there was an explicit research cross-subsidy in base funding. Since then, HESA has been silent on the split between research and teaching funds from the allocated funding from the Government per student.

Research block grants cover the cost of training higher degree by research (HDR) students and cover the systemic costs of research. Research block grants do not fully cover the indirect costs of research, which by necessity have been paid for by general university funds.⁵

The 2011 Higher Education Base Funding Review estimated that between six and twenty per cent of the Commonwealth Grant Scheme is a cross-subsidy for research. Further, the Higher Education Research Reform Amendment Bill 2014 recognised this by proposing to fund non-university higher education providers at 70 per cent of the rate for universities to account for the lower delivery costs as a result of them not being research active.⁶

Even if the proposed National Priorities and Industry Linkage Fund distribute the proposed \$225m per year among universities, in its current form, this will not restore the funding to levels that will allow research to continue as it currently stands. While Schedule 3 establishes the NPILF in legislation, there is little detail as to how it will operate. The Job-ready Graduates Package technical note shows that in

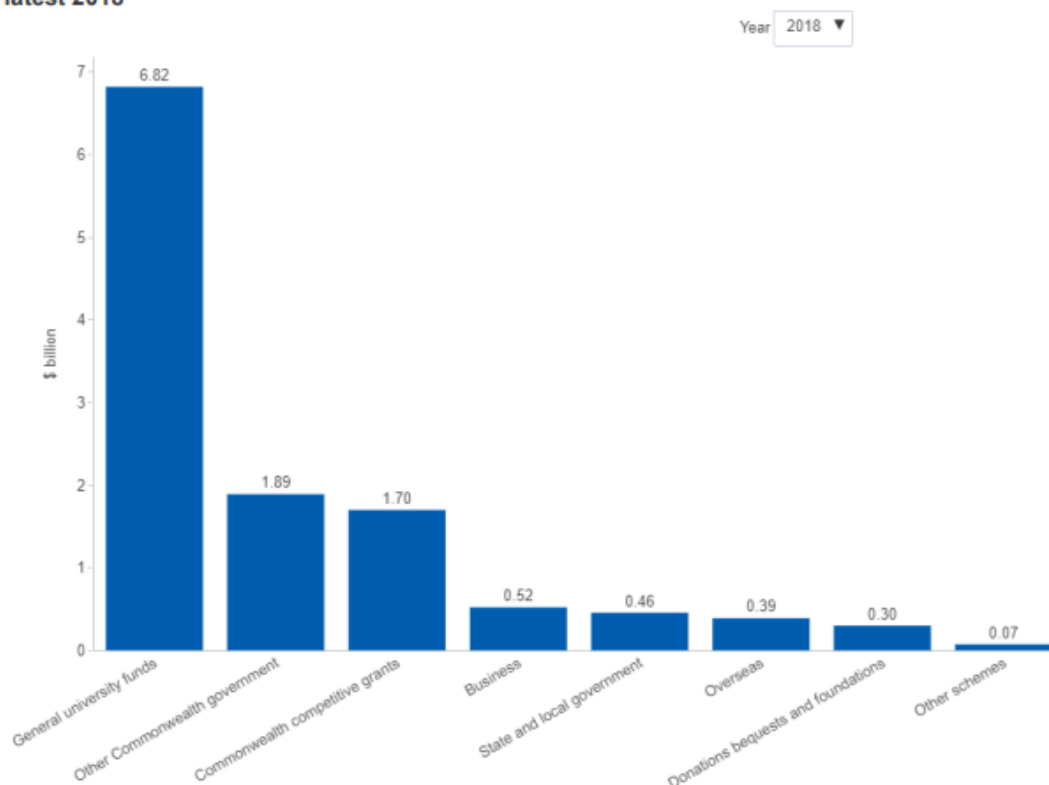
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its initial year it will act as a block grant based solely on student load of a university. The Committee should consider amendments to the Bill to place a floor under this fund, and all other grants (including research block grants) to provide the sector with some assurance of security of funding which is currently not provided in the legislation.¹

The reform of the Commonwealth Grant Scheme so that it is solely a teaching grant adds to the stress on our national research system. The removal of the cross-subsidy will come into effect at a time when universities are dealing with the additional loss of international student income and loss of industry income as a result of the pandemic border restrictions, and the associated economic recession.

The Academy believes that Australia's system of funding research is broken. Senators will need to consider the implications of this on the health of Australia's scientific research, and the implications for high-quality Australian university education.

Figure 3.3.3: Higher education resources devoted to R&D (HERD), by source of funds, \$ billion, latest 2018



Source: Australian Innovation System Monitor, September 2020 ⁷

The COVID-19 pandemic has accelerated the exposure of the deficiencies in Australia's approach to the funding of research and development. Universities undertake more than 40 per cent of applied research in Australia, as well as most of the fundamental research that will underpin future discoveries, industries and high-growth domains. In the absence of action to respond to the impacts

¹ The Higher Education Support Act current places a maximum amount on Commonwealth grants like research and equity grants. Unlike the Commonwealth Grant scheme, for which this Bill creates a floor.

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of the COVID-19 pandemic, a generation of researchers is being lost, thus wasting decades of investment in human talent.

The Bill is silent on the crisis facing research funding. However, the interconnected nature of university financing means that the Bill's impacts will be felt on all parts of the system.

The work of the Minister of Education's Research Sustainability Working Group will be crucial. All stakeholders and decision-makers must understand the proposals that emerge for future funding models and other solutions that could remedy the immediate threat to the research workforce. Only then will we understand how these proposals will interact with the provisions of this Bill.

Given the complex nature of research funding and the myriad of stakeholders involved, it is recommended that a comprehensive review of research funding in Australia be undertaken to determine the most sustainable and effective way to support the research and development our nation so heavily relies on.

Looking to the future

The Academy encourages the Government to turn its attention to safeguarding the future of Australian science research after the pandemic, including encouraging new partnerships and cultural change to reverse a decade of decline in business investment in research and innovation.

The full impacts of damage to the research workforce from the pandemic may not be completely apparent until our next national emergency. A diminished research capability will mean we are less prepared and able to respond and adapt to any such emergency. As Australia comes to grips with the recovery from the pandemic, the science and research system that has served the nation well must be placed on a more sustainable, and secure basis.

There is an opportunity for the Government to develop a holistic response to the funding of Australian research and a sustainable path forward. Without such a plan, this Bill will likely not achieve the objective of placing Australia's higher education and research sector on a more sustainable footing for the recovery from the pandemic and beyond.

Yours sincerely,

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President
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References

1. World Economic Forum. *Jobs of tomorrow: Mapping opportunity in the new economy*. http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf (2020).
2. Chapman, B. *Submission to Senate Standing Committee on Education and Employment, Inquiry into the Higher education Research Reform Bill 2014*. (2015).
3. Deloitte Access Economics. *Transparency in Higher Education Expenditure Transparency in Higher Education Expenditure*. (2019).
4. Australian Council of Deans of Science. *ACDS Response to Job-ready Graduates*. <http://www.acds.edu.au/acds-response-to-job-ready-graduates/> (2020).
5. *The indirect costs associated with university research funded through Australian Competitive Grants Final Report*. www.allenconsult.com.au (2009).
6. *Explanatory Memorandum - Higher Education and Research Reform Amendment Bill 2014*. (2014).
7. Bucifal, S., Herald, H., Stock, A. & Soria, B. *Australian Innovation System Monitor, September 2020 edition*. (2020).