

Defence Submission to 2023 Universities Accord Interim Report Submission

Executive Summary

1. Defence Science and Technology Group (DSTG) is Australia's second largest publicly funded research agency led by the Chief Defence Scientist and is part of the Department of Defence. DSTG is central to Australia's Defence and National Security through its capacity to reduce and mitigate strategic and operational risks and to create and maintain a capability edge. It does this by providing specialist advice on technology and innovative technology solutions, by developing new disruptive technology and solutions, by doing the classified work that can only be done in Government, as well as by shaping and harnessing the broader research and development (R&D) ecosystem.
2. Defence, as a substantial end-user of R&D plays a unique and foundational role in driving impactful outcomes. Defence challenges and opportunities sponsor many research activities across the university environment ranging from the physical sciences to humanities and social sciences. Defence's innovation programs engage with the university, research and industry sectors to translate research into new capabilities.
3. Defence closely engages with the higher education sector from a skills and training perspective, as the organisation requires a highly skilled workforce to successfully perform its core functions across both the Australian Defence Force (ADF) and its civilian groups. Ongoing and future acquisition programs such as the delivery, sustainment and operation of nuclear powered submarines will need to be supported by a highly skilled, STEM qualified workforce from both the VET and university sectors. Furthermore, the development and delivery of the next generation of asymmetric capabilities will be underpinned by fundamental research being undertaken in universities as well as publicly funded research agencies such as DSTG.
4. Defence appreciates the opportunity to make a submission in response to the Interim Report, and addresses the areas of greatest relevance to Defence. Whilst broadly supportive of the general policy proposals, inclusion of greater detail relating to specific proposals would have been beneficial. Consequently, Defence suggests further consultation is needed for the identified priority proposals.
5. Defence notes the Final Report would benefit from additional discussion on how the complementary initiatives of the Diversity in STEM Review and the refresh of the National Science and Research Priorities can be leveraged to ensure Australia's higher education sector operates in as effective and efficient a manner as possible.

Key reflections on the Interim Report.

6. Defence is broadly supportive of the issues and policy proposals explored by the Review Panel in preparation of the Interim Report. From a Defence perspective, ensuring Australia has access to a highly skilled workforce and sufficient scale and direction/balance of funding to support critical R&D activities are the most important issues explored in the Interim Report.

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7. Defence notes the Interim Report contains minimal consideration of issues relating to foreign interference in the higher education sector and the need to protect sensitive information/intellectual property. Defence recommends addressing these issues in the Final Report and provides further information below.

Skills and Training

8. Defence is completely dependent on the higher education sector providing appropriate skills and training opportunities to develop a highly-skilled workforce. In particular, current and future capability acquisition programs such as the delivery, maintenance and operation of nuclear powered submarines requires a highly-skilled, STEM qualified workforce as well as the broadest possible talent pool to minimise the competition across industries for talent.
9. Most STEM university courses experience greater participation from men. In contrast, humanities courses are dominated by women. Whilst the Universities Accord Interim report discusses at length the importance of equity of access and retention it focusses at the macro level – the attainment of post- school, VET and bachelor qualifications. A missed opportunity is to not delve deeper into redressing the gendered uptake of subjects, and coursework, in particular those courses which address our current and future skill shortages. Defence recommends the Universities Accord considers the urgent need to achieve greater female participation in STEM related subjects and greater male participation in course work that leads to jobs in caring for older and younger people. These strategies should extend beyond gender and include all forms of diversity.
10. Whilst specific comments on potential proposals and areas for further consideration are provided below, the lack of any specific information on how these proposals are intended to operate in a practical sense, limits the ability to provide fully considered feedback. It is not uncommon to see unintended consequences when designing new programs and initiatives, for example the Job-ready Graduates scheme. Any proposed initiatives and programs must be rigorously assessed to determine what, if any, impacts they may have on equity groups prior to implementation with plans to mitigate against these.

Research, innovation & research training

11. A high quality and well-resourced R&D ecosystem within the higher education sector is of vital importance to Defence, and should be a key focus of the Universities Accord. Fundamental research through to the translation of new capabilities has been and remains a key enabler supporting the ADF's strategic objectives.
12. Defence notes the R&D ecosystem is multi-faceted, comprised the interrelated pillars of fundamental research, enabling infrastructure, translation of research to capability, and training pathways for the next generation of researchers. It is crucial actions taken to strengthen the R&D ecosystem collectively address each of these pillars, as a fragmented approach risks having detrimental impacts on the remaining pillars.
13. The current approach to research funding within the higher education sector that does not cover the full costs associated with R&D activities has necessitated the cross-subsidisation from other funding sources such as international student fees. This is highly problematic in relation to the long-term sustainability of research funding, particularly in light of current

disruptions and competition in the international student market. Therefore, Defence recommends the Final Report explore mechanisms to ensure that research funding covers the actual costs incurred as part of R&D activities. Defence supports the potential proposals on page 115 of the Interim Report to increase funding for the ARC and First Nations knowledge and collaboration, together with providing long-term security of funding for research infrastructure by moving NCRIS to a 'future fund' style funding mechanism.

14. As noted previously, a greater level of detail on how these proposals are intended to work would have allowed for more fully considered feedback to have been provided on the proposals listed in the Interim Report.

International Partnerships and Foreign Interference

15. Defence agrees fostering international partnerships presents opportunities for both the higher education sector and the Government more broadly, particularly in relation to broadening the accessible talent pool and supporting broader foreign policy objectives. The increasing focus on alternative and multi-modal approaches to content delivery arising out of the COVID pandemic means the continued development of these partnerships also needs to consider the desirability of onshore vs. offshore delivery or a combination of both to facilitate maximum engagement.
16. Defence also welcomes the Interim Report statement that further consideration will be given to *"how the research could be protected and increased...and the need to ensure Australia has research capability in areas of sovereign risk"*¹. This is an area where Defence could assist the Review Panel in shaping the final report.
17. Noting the challenges which exist in the current geopolitical and geostrategic environment and the increased risk of foreign interference and data/information threat, it is vital to continue appropriate scrutiny and oversight of international partnerships, along with prioritising those partnerships of most strategic benefit. When exploring offshore delivery options for courses, care must be given to ensure there is no circumvention of restrictions on specific areas of research and affiliation by virtue of their mode/location of delivery. This ensures appropriate protections are in place to secure information, research, technologies and intellectual property
18. While some may see this as purely a Defence/national security problem, being aware of and responding to foreign interference and the potential for information/data/intellectual property threat is directly related to the economic viability of universities through their ability to capitalise on their intellectual property, as well as Australia's ability to benefit from the development of new industries.
19. Defence is also keen to explore how deepening appropriate international partnerships can be used as mechanism to promote commercialisation of Australian research capability internationally. In a defence context, Australia has developed world-leading capabilities such as the Nulka Active Missile Decoy and the Bushmaster Protected Mobility Vehicles. Both of these capabilities have resulted in economic benefits for the nation through the development of export markets and showcase our capacity to translate fundamental research into capabilities with real-world applications. However, these success stories remain the exception

¹ Australian Universities Accord Interim Report, Page 100

rather than the norm. Greater unified effort between Government and institutions is required to more effectively promote Australia's capabilities on the world stage, with greater emphasis placed on leveraging off existing relationships as trusted partners.

20. Defence can assist universities with developing such international linkages, particularly when undertaking collaborative research with our allies. Closer engagement between universities, Defence and an international partner from the outset may help identify clear translation/commercialisation pathways and ensure potential issues, such as information sharing, are addressed at the earliest opportunity, ensuring there is the appropriate balance of securing sensitive information and maximising potential end-user outcomes of research.

Areas of substantive agreement or disagreement.

21. Defence is broadly supportive of the proposals outlined in the Interim Report, particularly as they relate to the areas of 'skills and training', and 'research, innovation & research training'.
22. Defence has a great interest in ensuring that it has and will continue to have access to a highly skilled workforce that is able to respond to current and emerging challenges. The removal of barriers which impede the participation in higher education sector is vital to ensure there is a broad enough talent pool that all competing industries/sectors can access appropriately skilled staff without the need to actively compete with one another. It is also vital to ensure there is the appropriate alignment of courses/curriculum with the skillsets required to develop, deliver and operate the advanced capabilities used by the Australian warfighter.
23. Defence also has significant interest in ensuring that the world-leading fundamental research capability of the higher education sector is secured long-term. The higher education sector, primarily universities, have been a major partner with Defence of many years in the development and delivery of advanced capabilities for the Australian warfighter. However, as has been widely documented, the inability to fully fund research activities has led to long-term unsustainable approaches to funding through the cross-subsidisation of R&D activities through mechanisms such as international student fees. The reshaping of the research environment, however, is broader than solely focussing on the sustainability of funding for pure research. Reforms in this space must also focus on ensuring there are appropriate research training opportunities for the next generation of researchers, as well as transition mechanisms to translate fundamental research outcomes to the delivery of advanced capabilities.
24. Defence notes that the Interim Report contains over 70 different considerations for change and potential proposals, however, would like to re-iterate the importance of recommendations outlined previously in response to the Universities Accord 'Discussion Paper'², and proposes an additional suggestion (recommendation e(ii) for the Panel's consideration). The foundational nature of these recommendations are vital to enable a stronger university sector that is fully prepared to deliver future outcomes in the national interest.

² Department of Defence – Defence Science and Technology Group (DSTG) submission to the *Australian Universities Accord Discussion Paper*, Pages 8 – 10.

- a. **Drive differentiation of R&D and teaching offerings to alignment with national missions. Use the Government Scientists Group to assist in the defining the national missions and connecting research with the end use opportunities.**
- Connecting universities to specific outcomes-directed national missions, will help further the development of specialised and differentiated research capabilities, and deliver tangible outcomes and economic benefits for the nation. Noting the breadth of experience within the Government Scientists Group, this forum is well placed to advise on the nature of the national missions to be addressed and how best to align research efforts to tackle these missions.
- b. **Incentivise re-alignment of national research capability to industry capability and capacity. Encouraging alignment of the industries that can take innovations to market.**
- The lack of transition from fundamental research through the R&D lifecycle to achieve tangible outcomes means the nation is missing out on the economic benefits of new innovations. Incentivising better alignment between research efforts and our industrial base will aid in the creation of the next generation of jobs and sovereign industries, and provide new export opportunities and markets. Driving better alignment would encourage established industries to further invest in capabilities that deliver economic benefits and provide universities with greater capacity to partner with SMEs who often possess limited R&D capabilities.
- c. **Increase the percentage of GDP on research to 3%, and consider fully funding research to remove the reliance on cross subsidisation from international student fees.**
- Australia’s public expenditure on the tertiary education sector (both as a whole and exclusive of R&D activities) as a percentage of total government expenditure at 2.6% and 1.3% respectively is lower than the OECD average³. Countries such as New Zealand (3.6% and 3.1%), the United Kingdom (3.4% and 2.8%) and the United States (3.4% and 3.0%) are all reported to provide a greater level of support to the tertiary education sector as a whole and exclusive of R&D activities⁴. The lack of full funding for university research activities has necessitated cross subsidisation from other funding streams. This approach is unsustainable in the long-term noting increasing budgetary pressures economy wide, and may serve to limit the effectiveness and outcomes of R&D activities funded through such mechanisms.
- d. **Ensure PhD scholarships are sufficient to enable a living wage to remove disincentives to research training pathways.**

³ OECD (2022), “What is the total public spending on education?”, in Education at a Glance 2022: OECD Indicators, OECD Publishing, Paris.

⁴ *Ibid.*

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- The lack of financial security is a disincentive for prospective students to undertake further study, with many seeking to enter the workforce and earn a salary rather than face the prospect of juggling both further studies and part-time work for uncertain job prospects after completion. Paying a living wage may increase the talent pool of students undertaking postgraduate studies and could lead to studies being completed faster and to a higher standard.
- e. Fix research career pathways – (i) incentivise universities to offer ongoing roles and (ii) incentivise industry employment of PhD graduates.**
- (i) Australia’s ability to maximise the return on investment for its support of the higher education sector is inextricably linked to retaining a highly skilled workforce and benefiting from the development of new jobs and industries. Improving research career pathways and incentivising universities to offer ongoing roles to new graduates, would reduce the need for researchers to relocate overseas and encourage them to remain in the university sector.
 - (ii) Uncertain career opportunities in industry for PhD graduates are also problematic. In addition to the potential loss of skills and knowledge, the inability to imbed researchers with strong university linkages in industry impacts the ability to develop deep collaborations. Specific solutions could involve reviewing the support provided by the R&D Tax Incentive to ensure R&D activities being supported and the rate of reimbursement remain appropriate. Consideration could also be given to tailored support to facilitate the development of collaborative linkages between industry and universities.
- f. Incentivise systemic mobility between universities, industry and Government.**
- The mobility of talent between universities, industry and Government is crucial to ensure the appropriate skills and knowledge are available at the right place and time to tackle the nation’s critical challenges. However, the disparity in conditions, inability to maintain appropriate skillsets and to have prior service recognised across employers can provide a disincentive for highly skilled employees seeking to transfer between prospective employers. Removing these barriers would help ensure an agile and highly skilled workforce is available to pivot to areas of demand.