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Professor Mary O’Kane AC
Chair, Australian Universities Accord Panel
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Dear Professor O’Kane,

MARCS Institute for Brain, Behaviour and Development at Western Sydney University appreciates the opportunity to provide feedback on the Australian Universities Accord Discussion Paper. Below we provide responses to questions raised in the Discussion Paper that we are best in a position to discuss; some examples and references are included to support and/or illustrate the brief responses.

About MARCS Institute for Brain, Behaviour & Development

The MARCS Institute for Brain, Behaviour and Development is an interdisciplinary research institute of Western Sydney University. The vision for the Institute is to optimise human interaction and wellbeing across the lifespan. We strive to solve the problems that matter most through the themes: sensing and perceiving, interacting with each other, and technologies for humans.

The Institute comprises three programs – Brain Sciences, Biomedical and Human Technologies, and the International Centre for Neuromorphic Systems. MARCS is home to 80 academic researchers, 15 administrative and technical support staff, 30 part-time research assistants, and 50 PhD students. Research income that the Institute has secured since 2017 exceeds \$25M. Based since March 2022 in Western Sydney University’s Innovation Quarter in the heart of the Westmead Innovation District, MARCS Institute has more than 20 specialist laboratories with equipment assets exceeding \$7M, housed in an area of over 5000m².

Q23. How should an Accord help Australia increase collaboration between industry, government and universities to solve big challenges?

- a) Provide **incentives** tailored to different types of organisations, incentivising co-location between industry, government and universities as well as incentivising and supporting a “fail fast, fail often” mindset and agility. For example, Accelerator, MVP programs are set up for a linear increase in technological readiness and the incremental development of a particular innovative process or product. Fail fast and often tends to characterise innovation and step change [e.g., Babineaux, R., and Krumboltz, J. D. (2013). *Fail fast, fail often: How losing can help you win*. New York, NY: Penguin; Kline, W. A., Mason, T. W., and Dougherty, B. C. (2013). Being innovative – lessons learned from the practice of technology commercialization. *J. Eng. Entrepreneurship* 4, 17–30; Vedin, B. -A. (2014). On the quality of failure. *Int. J. Bus. Soc. Res.* 4, 83–92.]

- b) **Streamlining of processes** such as a clear framework for IP management that is both efficient and effective.
- c) Disentangling **innovation** from commercialisation and recognizing innovation for purpose not only profit. For example, major government tenders in Victoria require a social responsibility intent piece.
- d) **Increased education** not only for academic researchers working with industry but also for industry developing research capacity, expertise and know-how. For example, microcredentials and units in postgraduate courses that are developed in partnership with industry. Arizona State University is doing some interesting things in this space - see <https://research.asu.edu/ke-units> together with the idea of **Innovation Zones** at ASU <http://innovationzones.asu.edu/>

Q24. What reforms will enable Australian research institutions to achieve excellence, scale and impact in particular fields?

- a) **Retain a broad remit for the ARC Linkage project scheme** from advanced manufacturing and industry growth centres to both HASS and STEM. The tools and innovations in STEM often arise in response to grand challenges from HASS and Health; ChatGPT is one recent example. Hence investment needs to reflect use cases from a range of disciplines and domains. Also recognize dual use discovery and innovation.
- b) MARCS Institute for Brain, Behaviour and Development strives for a **balance of fundamental “basic” research and applied research translation**. The latter cannot be achieved without the former. Over the past 5 years MARCS Institute has seen transition to less reliance on ACG Category 1 funding with increased income from contract research in Category 2 and 3. Over this same period, the amount of total funding awarded has increased by 230%. A balance of basic and translational research delivers excellence and, through industry collaboration, impact and scale.

Q25. How should Australia leverage its research capacity overall and use it more effectively to develop new capabilities and solve wicked problems?

- a) **Broaden the scope** of ARC industrial training centres and hubs beyond heavy industry. One possible mechanism is joint appointments e.g., industry fellowship scheme running in both directions from industry to university as well as university to industry.
- b) Provide **incentives** to remove systemic barriers **between universities** to benefit maximally from cross-institution complementarity. For example, currently there can be more competition than collaboration in research networks.
- c) Review **scholarship stipends and models** for Higher Degree Research Candidates (see more in Q27 below).

- d) Consider STEM thinking from the **earliest years**. For example, sustaining quality STEM thinking and education comes from supporting and equipping STEM teachers with knowledge and tools. Universities and researchers can play a role here through programs that support teacher professional development that communicate cutting edge applications of STEM thinking and discipline knowledge.

Q26. How can Australia stimulate greater industry investment in research and more effective collaboration?

- a) A **co-design** model is good, although barriers can exist when researchers seek partners to work with. Need to identify roadblocks from Industry perspective on why it's difficult to work with universities. Some issues are the need for better IP frameworks, clearer deliverables, personnel turnover in university is perceived as too risky (i.e., no continuity as researcher moves on). Two examples of German institutes that provide permanent research positions and are successful with industry collaboration are [Fraunhofer Institute](#) - the world's leading applied research organisation, focusing 100% on industry collaborative applied research, and [Max Plank Institutes](#) that undertake both applied and basic research. Permanent research positions provide the necessary continuity of relationship and trust with industry.
- b) Partnerships could move **beyond individual researchers** at an institution working with an industry partner to be program-level, in some cases, with Institution-wide Memorandums of Understanding.

Q27. How can we improve research training in Australia including improving pathways for researchers to gain experience and develop high-impact careers in government and industry?

- a) Precarious employment for Early Career Researchers means less people are into the system, and more people leaving. Providing more fellowships at one level is not as effective as providing ongoing support across career levels. Instead, there is need for continuity/structure. NHMRC used to provide career-long funding via their Fellowship Scheme for leading researchers, why did that end? Consider such schemes to increase continuity.
- b) **PhD Model needs to change**. 3 years very short to become expert in field. Instead, the European Model (4 years with a large teaching component) that embeds PhD candidates in the workforce could be explored. [Reference: Barnett, J.V., Harris, R.A. Mulvany, M.J. (2017) A comparison of best practice for doctoral training in Europe and North America, *FEBS Open Bio*, 7(10), doi: [10.1002/2211-5463.12305](https://doi.org/10.1002/2211-5463.12305)]. In addition to the timeframe of candidature, **PhD stipends** have increased to \$31,500 but is not enough to support cost of living. Need for increased focus on industry funded scholarships and co-funded industry funding.
- c) **Invest in research workforce** including joint appointments, paid internships, 21C model for doctoral and postdoctoral research. Other ideas in the literature for how to

develop academic careers from: Sarrico, C.S., Rosa, M.J., Carvalho, T. (2022) Research Handbook on academic career and managing academics, Edward Elgar Publishing, <https://www.e-elgar.com/shop/gbp/research-handbook-on-academic-careers-and-managing-academics-9781839102622.html>

- d) In coming years, society will be swamped in the output of Large Language Model (LLM) (e.g., ChatGPT) - it will become increasingly more important for universities to **train people in how to think** and evaluate information. Moreover, it will be important to enable people to best use LLMs.

Q41. How should research quality be prioritized and supported most effectively over the next decade?

- a) Greater funding is one way to increase quality but need **more emphasis on replicable research**, good practice and less on metrics. Quality is not assured by metrics as they can be gamed. The [DORA Agreement](#) aims to advance practical and robust approaches to research assessment globally.

One final observation we note is that comparing Australia's basic research expenditure to other countries as a percentage of total research budget is misleading. **We strongly urge the government to increase its funding in research across the sector.** Using data from the [World Bank](#), Japan spends 3.26% of its GDP on Research and Development, whereas Australia only uses 1.83%. Japan spends 13% of this on basic research (0.4238% of their GDP), whilst Australia is spending 22% (0.4026% of GDP). This means Australia's actual investment in basic research by percentage of GDP (which accounts for population) is **5% LOWER** than Japan. This seems counter to the point the Accord is trying to make.

Thank you for the opportunity to submit these ideas to the Australia Universities Accord Discussion Paper. Where useful, further detail and evidence can be provided to support the positions promoted in this submission.

Yours sincerely,



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