



31 July 2008
Professor Kurt Lambeck, PresAA, FRS

Emeritus Professor Denise Bradley, AC
Review of Australian Higher Education
Location 023
GPO Box 9880
Canberra ACT 2601

RE: Review of Australian Higher Education Discussion Paper

Dear Professor Bradley,

A strong higher education system is crucial to develop and maintain the skills base needed for Australia's continued competitiveness in the global marketplace. In a world where Australia's current science and technology advantage could be eroded rapidly, it is appropriate and timely that a comprehensive review of the higher education system is undertaken.

The Australian Academy of Science, as the peak scientific body in Australia, welcomes the opportunity to present its views regarding the Department of Education, Employment and Workplace Relations *Review of Australian Higher Education* to the expert review panel. In this submission, the Academy focuses its comments on research and development (R&D) at higher education institutions.

The Academy addresses three main points relating to the discussion paper, namely:

1. The importance and future of Australia's higher education institutions;
2. University funding sources; and
3. Business R&D support in Australia, including links between industry and universities.

Further, the Academy comments on several issues not directly addressed in the discussion paper, but of importance to a review of the higher education sector:

1. Student to staff ratios;
2. Women in science; and
3. Support for early career researchers (ECRs)

The importance and future of Australia's higher education institutions

The Academy's recent policy statement identifies ten actions Australia must take to maintain a strategic economic position globally¹. The first recommendation, "*that Australia increases its support for the national R&D effort to ensure that it retains an internationally competitive science capability to underpin the nation's industrial, commercial, environmental and economic position among leading world economies*" applies directly to the higher education sector, as one of Australia's major R&D contributors.

Planning for a secure future is a complex issue. We cannot predict what the principal science and technology developments of the next decades will be. Trying to pick winners is therefore a difficult task. Australia can only attempt to do so if it has a very broad based research capability in the first place, one that leads the world in some areas and has the potential to lead in other areas in the future. Australia's higher education institutions play a crucial role in the nation's R&D capabilities. They are the nation's largest producers of future scientists, innovators and policy makers. They are also a provider of both basic and applied research.

Therefore, a broad approach must be adhered to in shaping the future of the higher education sector. The Academy welcomes the discussion paper's comment that collaborative work between the Review of Australian Higher Education and the Review of the National Innovation System will be undertaken in two key areas: increasing research collaboration between the public and private sectors; and the development of skills as a supply-side infrastructures issue for the knowledge economy². This cooperative approach has the potential to achieve a coherent policy review of these key components of the higher education.

University funding sources

The Academy notes that a significant portion of the increased funding available to higher education institutions derives from the income from full-fee paying students, either domestic or from overseas. In fact, the discussion paper states that the shift to private funding for tertiary education has been more pronounced in Australia than in many other countries:

“... funding for tertiary education from all private sources increased by 98 per cent between 1995 and 2004... in 2004, the proportion of private household expenditure on tertiary education was more than 30 per cent in Australia...”³

Generation of external income is to be commended. However, the Academy stresses that the process must be fully costed, to maintain excellence of the research and teaching base on which the international and national competitiveness of our institutions rely. A portion of any 'profit' from these external revenue generating activities should find its way into supporting the core science and research programs of the institutions.

¹ Australian Academy of Science, September 2007. *Research and innovation in Australia: a policy statement* <http://www.science.org.au/reports/aas-policy-2007.pdf>

² Australian Government, June 2008. *Review of Australian Higher Education Discussion Paper*, pp 45

³ *ibid.*, pp 65

A related concern is the potential for, or perception of, a lowering of standards for privately funded education, particularly in a rapidly evolving international context.

The European Union has targeted GERD (Gross Expenditure on R&D) at 3.0% of GDP by 2010. In comparative terms, the situation in Australia is serious. In 2004-05, Australia's GERD/GDP ratio, at 1.76%, remained below the OECD average of 2.26%. This figure ranks Australia at 18th place in the list of 30 OECD countries.

The Academy is concerned at the commercialisation of universities, and notes that the discussion paper goes as far as to suggest "the term 'public' university now refers more to the historical circumstances at the time of foundation rather than the nature of institutional financing."⁴ In its policy statement, the Academy cautions against an expectation that an ever-increasing proportion of funding can be obtained from the private sector. It notes "the ability of a university to attract private sector research contracts or grants depends on the quality of its core research capability, which is largely driven by public sector funding, especially competitive grants... Attempting to increase the level of private sector sources to too high a level would have the effect of 'quarrying' the intellectual capital of the university, ultimately compromising the integrity of its core research capability, thus reducing its capacity to provide the quality research required."⁵

Business R&D support in Australia, including links between industry and universities.

The Government has a leadership responsibility for creating the right environment across Australia for the growth of innovative industries. BERD (Business Expenditure on R&D) in Australia remains well down in the bottom half of OECD countries. As the discussion paper notes, this "leaves Australian universities more dependent upon government funding."⁶ Although there are few examples of major industries with a substantial research focus, there is potential to develop interfaces that lead to increased collaboration and exchange. The Academy recommends "that Australia examines the implications of the continuing relatively low level of private sector investment in R&D and creates policy settings that encourage greater innovation."⁷

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In addition to commenting on issues presented in the *Review of Australian Higher Education* discussion paper, the Academy draws attention to several important matters that also relate directly to the higher education sector.

Student to staff ratio

Allowing student numbers to increase without a corresponding increase in academic staff numbers is a widespread practice to keep expenditure costs low. The negative impact of this practice must be addressed if Australian higher education institutions are to maintain their current international standing for educational excellence, let alone improve their position.

⁴ Australian Government, June 2008. *op. cit.*, pp 11

⁵ Australian Academy of Science, September 2007. *op. cit.* pp 8-9

⁶ Australian Government, June 2008. *op. cit.*, pp 47

⁷ Australian Academy of Science, September 2007. *op. cit.* Recommendation 2

There are no simple figures which prescribe the optimal ratio of staff to student, especially for postgraduate students who require a more intense level of supervision than undergraduates. Supervision requirements vary substantially across different disciplines. However, the quality of supervision is of primary importance across all disciplines, and quality cannot always be guaranteed in the current state of Australia's academic institutions.

The issue is further compounded by the emphasis on research in promotion criteria, leading to an increasing number of academics spending more time in research and less in teaching activities. A culture where teaching has a higher value is required to address this trend.

Women in science

Approximately 50% of Australia's undergraduate and postgraduate students are women, yet they represent only 20 to 25% of career scientists. Attrition rates are high in women in their late 20s and their 30s. Australia is wasting a large part of its intellectual power.

Not enough is known about the decision-making processes, incentives or disincentives for women to remain in the productive academic workforce. However, it is clear that the current academic reward and recognition systems do not cope well with any discontinuity in career path. Female scientists are receiving inadequate quality of childcare and insufficiently flexible employment after returning from maternity leave.

To attract and to retain a large portion of its female graduates in research, Australia needs to better understand and assist its female scientists through initiatives that will support women to move beyond being strong competitors in their early research careers to becoming research leaders.

Support for early career researchers (ECRs)

The Academy is concerned about the quality of support and training received by postgraduates. In its policy statement, the Academy recommends "that Australia gives urgent attention to nurturing rewarding and secure career paths for talented early career researchers."⁸

The Academy welcomes the Federal Government commitment of \$209 million over four years to double the number of postgraduate scholarships available to higher degree students by 2012, from 4,800 to nearly 10,000.⁹ However, while the increased number of scholarships is a welcome development, scholarship places must be accompanied by research training that will better prepare postgraduates for the real world. Postgraduates need training that will take them beyond their university department, to prepare for careers that may be in a very different environment and will undoubtedly change over time.

⁸ Australian Academy of Science, September 2007. *op. cit.*, Recommendation 9

⁹ Hon Kim Carr media release, 13 May 2008. *Government to give more postgraduates a head start.*

<http://minister.innovation.gov.au/SenatortheHonKimCarr/Pages/GOVERNMENTTOGIVEMOREPOSTGRADUATESAHEADSTART.aspx>

In February 2008, the Academy held a two-day workshop entitled *Enhancing the quality of the experience of postdocs and early career researchers*. Participants were selected early career researchers from universities and other research institutions across Australia. The young scientists contributed to discussions aimed at determining what skills and mentoring are needed by scientists entering careers in universities, research institutes, industry and government agencies. The outcomes of the workshop are being used by the Academy to create a best-practice guide for research management for wider use.

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While the Australian community has been well served by its universities in past decades, within the framework of rapidly changing technologies and challenges, of changing demographics and aspirations of its population, and with a shift in the global balance of major players in university research and education, we cannot be confident that this will remain so in the years ahead. The review therefore is both timely and important.

The Australian Academy of Science would welcome the opportunity to discuss this submission further with the review panel should the panel so wish.

Yours sincerely,

A handwritten signature in black ink, reading "Kurt Lambeck". The signature is written in a cursive style with a long horizontal flourish underneath.

K Lambeck