

Submission to the House of Representatives Standing Committee on Industry, Science and Innovation Inquiry into Australia's international research collaborations.

The University of Melbourne



The following submission addresses the 5 terms of reference (TOR) of the inquiry into Australia's international research engagement.

TOR (1): The nature and extent of existing international research collaborations

Internationalisation is embedded in the University's strategy for research, education and knowledge exchange.

With some 10,000 students from beyond our shores, the University of Melbourne has one of the largest bodies of international students of any university in Australia, as well as an extensive network of international alumni. Internationalisation and international education have been important strands of the University's strategy for many years.

International research collaboration at the University of Melbourne is difficult to map quantitatively, as it underpins almost all research undertaken at the University. It is also undertaken in many different ways, for example via:

- Exchange visits between Australian and overseas institutions by staff and students, particularly student exchange with partner institutions
- Membership of consortia of highly ranked universities, eg, *Association of Pacific Rim Universities (APRU)* and *Universitas 21* providing a global perspective, not just a bilateral view
- Joint research projects that are funded by competitive grants (both by domestic and overseas sponsors)
- Joint research projects that are unfunded
- Joint research publications
- Researcher-to-researcher links around particular research questions and themes
- Bilateral relationships for academic and research cooperation
- Research Networks and Consortiums
- Conferences
- Patents

Research areas highlighting international collaboration and partner countries

Based on joint research publications and successful research grants with global partners over the past 2 years, the top 5 broad areas of research in which the university most engages internationally are:

1. Medical and Health Sciences
2. Biological Sciences
3. Information, Computing and Communication Sciences
4. Agricultural, Veterinary and Environmental Sciences
5. Engineering and Technology

The countries which represent the university's most frequent partners in research activities over the past two years are:

1. USA 2. UK 3. Germany 4. China 5. France 6. Italy 7. Japan 8. Canada

Bilateral Agreements

The internationalisation of the university is underpinned by numerous agreements with universities and governments in other countries. These support research partnerships, academic staff exchanges, curriculum development, student mobility opportunities and help us to meet global challenges.

- The number of current whole-of-University Level bilateral agreements with overseas institutions totals 105, spanning 30 countries, with 92 (88%) of these agreements including Memoranda of Understanding (MOUs) for academic/research collaboration and 81 (77%) of these Agreements including postgraduate student exchange.
- The number of current University of Melbourne Faculty level bilateral agreements with overseas institutions totals 109, spanning 27 countries, with 79 (75%) of these Agreements including MOUs for academic/research collaboration and 51 (47%) of these Agreements including postgraduate student exchange.

University Staff profile

Many University staff have been educated or have worked overseas and a further indicator of the international profile of the university is therefore evident in the institution's staff profile. Data gathered on the country of birth of University full time and fractional full time staff shows that (where country of birth is known), those who were born outside Australia make up 14% of our staff profile, with the greatest number originating from North-West Europe, followed by South East Asia, Southern and Eastern Europe, North-East Asia and Southern and Central Asia.

The highest count of staff members who were not born in Australia is in the Faculty of Medicine, Dentistry and Health Sciences, however, the Faculties with the highest proportion of staff not born in Australia are Engineering, Arts and Economics and Commerce. The largest number of staff members who were not born in Australia fall within the 40-44 age group, followed by the 45-49 age group.

International research strategy

In terms of international research collaboration strategy, the University seeks to influence the nature of collaboration, particularly in the identification of priority geographic regions, and through the provision of advice on the suitability of institutions within those countries, based on background research that takes into account consideration of international rankings, known strengths, existing collaboration etc. However, in the vast majority of cases, individual academic contacts (researcher-to-researcher) are at the root of successful collaboration, building on mutual research interests, similarity of programs, conditions and approaches and the (joint) ability to access funding opportunities.

Funding

Currently, most international collaborations are funded within existing projects in order to improve the quality and outcomes of the project, with researchers finding difficulty in securing such funding for international collaborations.

International collaboration is often built into grants and funding schemes and therefore difficult to identify, resulting in uncertainty as to the current extent of international collaboration.

Nationwide statistics

With regard to existing Australian international research collaborations, the following information has been reported:

- The Australian Research Council reported that ‘The ARC as a whole has the highest number of international collaborations with USA (35%), followed by England, Germany and the Peoples Republic of China (15%, 11%, 10%, respectively). The level of international collaboration now stands at 40% for all Australian output, and slightly above this for ARC in total’¹
- The ARC also reports almost 9,000 instances of international collaboration in ARC proposals submitted between 2002 and 2006²
- Australian Academy of Science (AAS) reported Australia is formally involved with approximately 100 major global scientific organisations³
- The Department of Innovation, Industry Science and Research reported over 200 instances of international collaboration in the International Science Linkages Programme between 2002 and 2006⁴

TOR (2): The benefits to Australia from engaging in international research collaborations

The key benefits to Australia from engaging in international research collaborations are:

- Timely access to expensive infrastructure, data and knowledge that a single country the size of Australia could not accommodate (eg CERN, National Laboratories in the USA, Japan or Europe).
- Knowledge transfer - Keeping in touch with the latest developments in ideas (including technical advances and equipment) and links, ensuring research is internationally competitive
- International benchmarking. Allowing Australian research to be benchmarked against world-best practice through partnerships with world class researchers and research centres
- Enhanced international reputation - less Australian isolation leading to improved international visibility of Australian research, with the dissemination of achievements of Australian researchers to the widest possible audience. New research published in high impact journals (and therefore improved citation rates)
- Access to international funding and investment, and to overseas institutions that have a higher level of resources available, without having to compete in the same funding pool.
- Staff and student exchange and training, attracting world class higher research degree students and early career researchers to Australia, and enabling Australian students and ECRs to learn skills of an international standard
- Capacity to address the “big issues” that could not be tackled by any one institution in isolation or by any one country, as well as the ability to influence international trends in research (eg issues of food security, resource sustainability, climate change are not limited by borders)
- Maintenance of friendly relations with other nations

¹ ARC-supported research: the impact of journal publication output 2001–2005

² Global Engagement Working Group Report to PMSEIC, December 2006

³ Australian Academy of Science. Maximising the benefits from Australia’s formal linkages to global scientific activities, 2005

⁴ Global Engagement Working Group Report to PMSEIC, December 2006

TOR (3): The key drivers of international research collaboration at government, institutional and researcher levels

The key drivers at the *government* level for international research collaborations are:

- Increased ability to deliver broader social, environmental and economic benefits to Australia
- Access to expensive infrastructure. Costs associated with large facilities and infrastructure required for large scale projects can be reduced by forming partnerships with international research institutions and funding bodies.
- Enable Australia to command a position on the world stage and help to influence the international research agenda and be a partner of choice in a wide variety of disciplines
- Address complementary national/global challenges and priorities. Sharing expertise allows bigger and more important problems to be addressed that cannot be addressed by Australia (a mid-size country) on its own.
- Global influence and maintenance of friendly relations
- Knowledge transfer
- Information and communications technology (ICT) enables and drives international collaboration by overcoming the issues related to the geographic isolation of Australia
- Enhanced international reputation of Australian research which, in turn, leads to increased foreign investment in Australian research
- Skills development and recruitment
- Contributing to national and global security, trade and foreign policy objectives
- Capacity building

The key drivers at the *institutional* level for international research collaborations are:

- Increased recognition from overseas institutions and funding bodies, leading to increased research income
- Improved research outcomes that further build the reputation of the university as a world leader in research, generating a higher prestige level
- Increased access to world class facilities and expertise, which will result in increased funding of research
- Increased ability to recruit high quality students into research and researchers (particularly Early Career Researchers) to the university
- Student and staff exchange opportunities

The key drivers at the *researcher* level for international research collaborations are:

- Publications in higher ranked and high impact journals leading to improved citation rates, and more competitive grant applications
- Keeping in touch with the latest developments in ideas and links, ensuring research is internationally competitive
- International benchmarking
- Dissemination of research to the widest possible audience
- Timely access to data/specialised skills/infrastructure that are not available in Australia
- Access to international funding, universities that are better resourced, working with researchers that are not competing for the same limited funding pool
- Staff and student exchange, attracting world class higher research degree students and early career researchers
- Capacity to address big problems that could not be done independently
- Training/exchange opportunities for Australian PhD students and early career researchers

TOR (4): The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these

Impediments

- i) *Access to Funding* –lack of access to funding is the major impediment which limits Australian researchers to leverage their involvement in overseas networks. The short-term nature of many funded collaborations also impedes the development of longer term partnerships.

a) *Overseas funding opportunities*

There is considerable funding outside of Australia, but it is generally not accessible to Australians, and researchers often lack knowledge of the existence of much of the funding. For example, under the European Commission 7th Framework Programme (EC FP7), no research money is available for the Australian side of the research unless it can be argued that Australian participation is absolutely critical to the success of the project. The amount of funding an organisation is expected to bring to a project is prohibitive as the Australian researchers currently do not have access to an adequate contribution of research project funds.

Some countries (and sponsors) have a direct policy not to fund non-resident researchers. For example, the Wellcome Trust does not allow any Australian partners. For North American funding bodies, (eg National Science Foundation, NIH) the nuances of the major funding bodies and the eligibility of Australian partners to participate is also complicated and difficult to interpret, which can result in Australian researchers being reluctant to apply.

If successful in gaining overseas funding opportunities there is also the need to understand the reporting and compliance requirements of the international funding body. The additional requirements can be onerous and advice is needed as to how to meet the demands and obligations of individual international funding bodies, so as not to jeopardise funding received.

The award of prestigious grants such as a European Union grant, Volvo Foundation award, German Humboldt award should be promoted more vigorously. These grants are awarded after competing against research teams from multiple nations and with a larger number of applicants, than, for example, an ARC grant. However, in the Australian system, there appears to be a lack of appreciation of the prestige of such global grants, as the focus is on the success from the major Australian Government funded programs.

b) *Domestic funding opportunities*

There are Government programs that have funds specifically for international collaboration, however, the amounts available for individual projects are limited, and most of the funding is for travel costs and living expenses, which, while needed, do not cater for the actual costs of the research itself.

The Australian Research Council (ARC) has removed the Linkage International scheme from its grants program and has now introduced International Collaboration Awards within the Discovery Projects scheme, which fund named investigators to work together on research projects. However, these awards are not guaranteed even if the actual Discovery Project is awarded.

In addition, other ARC Fellowships and scholarships are now open to non-Australian citizen which is a positive step that will promote international collaboration.

However, because of the very low success rate for Discovery Projects and ARC Fellowships, and the fact that there is not a dedicated pool of money for any international collaboration, only a small amount of the total funding is actually allocated to international collaboration. In addition, the ARC Linkage International scheme did provide the much needed seed funding that

led to initial collaborations, which in turn enabled the more advanced collaboration that is required for larger grants. This is now a gap in the ARC funding.

The National Health and Medical Research Council (NHMRC) appear to be heading in the right direction, with a relaxation of eligibility guidelines such that overseas investigators are able to be named Chief Investigators on projects. The policy relating to international applicants has also been adjusted to enable overseas applicants to apply at any time in the funding year for Australia Fellowships.

Further, the NHMRC Overseas Fellowships provide the opportunity to enhance a post-doctoral researcher's career by providing support for 2 years full time training overseas, returning to Australia for a further 2 years. Overseas Fellows receive, apart from a salary package, accommodation and cost of living allowances that are calculated for individual host cities. These are excellent fellowships, however, are offered only to a limited number of persons.

The NHMRC *European Union Collaborative Research Grants* provide assistance to Australian medical and public health researchers to participate in projects with international researchers that have been selected for funding under the European Commission FP7 programme. The NHMRC has allocated a total of \$2 million per call for applications. Currently there is no equivalent funding for Australian non-medical research participants in FP7.

The eligibility requirements of Australian government funding bodies also make it difficult to attract world leading researchers to participate in research funded by Australian sponsors. For example, non-Australian residents are not able to act as Chief Investigators on ARC Discovery Projects, and can only be included as a Partner Investigator if they 'secure a significant contribution of cash, or in-kind or other resources from the researcher's organisation for the proposed project'. There is also the restrictive requirement for ARC and NHMRC grants that the Chief Investigator must reside predominantly in Australia for the full term of her/his participation in the project.

The emphasis on the value of a research project to Australians as opposed to the benefits for international research and policy, and the focus on the Australian National Research Priorities also result in limitations being imposed on the value of the research to the international community.

The Department of Innovation, Industry, Science and Research (DIISR) coordinates the International Science Linkages (ISL) program. Unfortunately, the main element of this program, the Competitive Grants, which provide support for Australian participation in leading edge, researcher-initiated, international science and technology projects, was not funded in the 2009-10 Budget, and, as a result, no Competitive Grants round was held in 2009.

There are other DIISR, ISL programs that provide support for joint collaborative scientific research projects between Australian and Chinese, and Australian and French researchers, however, this is complicated by the fact that, as with many joint funding schemes for international collaboration, there is a requirement to apply to two separate funding schemes for the one project. The separate application process leads to a lack of coordination, individual peer review and the possibility that one of the research teams may not gain funding, while the other does.

In general, there is substantial opportunity to increase the value of funding available for international collaboration from the Federal Government, particularly to provide financial support for Australia's brightest, postdoctoral researchers to engage overseas.

(c) Funding family support needs for international collaboration:

Recent reports indicate that women researchers in Australia are falling behind, particularly in the Science, Technology, Engineering and Mathematics disciplines, and that this is an issue of concern for Australia's research capacity building. An important issue that affects many researchers, especially at the early and mid-career stages, is the lack of any funding to support child-care or family-travel costs for international conferences and collaborations (it is normally specifically excluded from competitive grants, but is an essential cost for researchers with young children).

ii) Ability to recruit (and retain) researchers (particularly Early Career Researchers) and high quality research students to/in Australia

In terms of financial support and programs, there are few funding opportunities explicitly aimed at the retention and training of early career researchers. It is recognised that more opportunities have arisen for mid-career researchers by way of the ARC Future Fellowships scheme, and a similar, broader scheme needs to be considered to promote the movement of early career researchers to and from Australia.

With regard to research students, although there are a number of fee remission and living allowance scholarships offered under the Endeavour Awards program, the numbers are limited and the stipend is not competitive with other international scholarship programs. This results in the best students taking up their research degrees outside Australia.

iii) Visa issues

Administrative barriers such as the visa protocols can make study, research and international exchange options in Australia prohibitive and unattractive for many overseas students and researchers. International collaborators that visit for lengthy periods of time, but are funded by their home institutions, also face difficulties in making visa arrangements.

PhD student visas are also problematic. PhD students are an excellent way to form international collaborations. However, Australia does not allow part-time PhD student visas, which is prohibitive for those PhD students who cannot leave their other commitments on a full-time basis. Current visa requirements will only allow international students to take leave of absence and maintain the validity of the student visa under very limited circumstances. This rigid visa regime also affects Australia's ability to enhance international research collaboration, given the difficulty in organising visas for brief visits or academic exchanges.

iv) Compliance and contractual issues

International jurisdictions vary significantly in the nature of their legal, ethical and regulatory compliance requirements and the legislature underpinning their research and innovation systems. For example, in Australia the approvals processes for animal research ethics are managed through universities whereas in the UK, there is a single national office. The differences in the systems add complexity and may be a disincentive to collaboration.

Similarly, the establishment of formal international collaborations at the project level are often impeded by research offices navigating through cross-jurisdiction legal and funding guidelines. The compliance requirements of each individual international funding body is often seen as an impediment and the capacity to interact directly with the funding body is limited. For example, Australian researchers and their institutions often have trouble understanding the bureaucracy of the European Union Framework Programme. For Australian researchers to be involved, even without receiving EU funding, there are substantial bureaucratic requirements.

Better forms of coordinated nationally provided advice in relation to the nuances of overseas funding body guidelines and requirements are needed in a one-stop shop approach would be valuable as it would allay researchers concerns about having to learn an entire new set of funding rules and obligations.

With respect to the finalisation of contracts to undertake internationally collaborative research, it is difficult to negotiate with large overseas institutions / companies who have fixed positions, with a lot of time spent focusing on individual contract clauses, as there is no agreed default position. The onus of contracts that are complex and appear over-bureaucratic is a challenge for Australian researchers and more support and advice is needed in this area. There needs to be recognition that another barrier to international collaboration is the issue of time commitment. There are workload implications of successful collaboration related to the need to keep abreast of contractual obligations.

There are also jurisdiction problems, in that most international organisations will seek to have agreements governed by their own country's laws, eg, in the US ownership of intellectual property is determined by federal and local legislation.

v) *Geography and culture*

One of the main practical challenges is geographical isolation. This does not only translate into a personal reluctance or cost difficulty to travel for specific collaborations, but it means that Australian scientists and their overseas colleagues have less frequent opportunities for informal interactions and discussions, such as on the sidelines of conferences, in comparison with European or North American researchers. This also makes it more difficult to identify appropriate overseas research partners. It is inevitable that academic networking will occur more naturally, the closer your physical location is to where key disciplinary centres are located. This means that, proportionally, there should be greater funding support for international collaborations in Australia, in comparison with most other western countries. However, this does not appear to be the case.

New technologies such as email and Skype do enable researchers to collaborate more easily across time zones. This is most useful in established ongoing research collaborations where the researchers know each other well. They not be as beneficial in new collaborations.

Further, because of the geographical position of Australia, Australian academics need to do a lot of research 'service' roles in the maintenance of their international reputations, for example, journal editing and editing books. This work goes unrecognised in national Excellence in Research for Australia (ERA) style assessments.

There is also the perception of distance, especially from potential international collaborators in other countries – not only geographical, but in terms of language, time-zones and semester dates, and deadlines for joint grant proposals. Currency and exchange rate issues may also arise, for example, the time between the submission of an original proposal and the final agreement may result in shortfalls in amounts agreed on.

Cultural differences in norms for collaborative work, lack of understanding of overseas parties' interests, and the cultural differences in international funding bodies are all issues when attempting to successfully collaborate internationally.

Practical measures for addressing the impediments faced by researchers. These are measures that can be achievable in the short term, for longer-term strategies, please refer to TOR (5)

i) Access to Funding

- Seed funding for small projects that allow researchers to trial international collaborations and/or run seminars around a particular topic
- Increased flexibility in the timing of research applications, to allow for the fact that the Northern Hemisphere application timing is very different from Australia's.
- Increase support for applications by way of advice, training sessions, talks by successful applicants about pitfalls and successes
- Greater staff and RHD access to travel funds, with increased funding support for sabbaticals and overseas visiting scholar programs. Sabbaticals are an excellent tool to provide rewards not only to the individual, but to the organisation they are employed with, and, ultimately, to the country. They should be seen as a strategy for increased collaboration and exchange, and be treated as 'the norm'.
- Increased funding to support researchers who have family responsibilities. There needs to be flexibility in transitions between work and family responsibilities. For example, providing funds to support child care to enable researchers to travel to international conferences.
- Funding key pieces of equipment for early career researchers
- Review of investigator status for overseas partners on ARC grants (and the like)
- Increased recognition by research institutions and Australian funding bodies for international research collaborations and the prestigious international funding bodies

ii) Ability to recruit (and retain) researchers (particularly Early Career Researchers) and high quality research students to/in Australia

- Staff Recruitment – have an increased pool of Fellowship opportunities available, both short and long term, with opportunities for both incoming and outgoing Fellowships. The Fellowships should not be limited to the two main funding bodies of the ARC and NHMRC.
- In general, increase the availability of high quality, readily accessible and affordable child-care facilities and make this an allowable form of research budget support, to improve the retention of women in a research career.
- Increasing the number of international fee remission and stipend scholarships. By attracting high quality postgraduate students to universities, these 'for life' relationships would build up both the university and Australia's reputation quickly – this needs investment by way of high value scholarships
- Increased facilitation of student and researcher mobility overseas.

iii) Visa issues

- Relaxation of visa requirements for collaborations

iv) Compliance and contractual issues

- Negotiating reciprocal recognition of ethics approval between countries
- Template overseas research collaboration agreements.

v) Geography and culture

- Provision of infrastructure funding support to enable access to, and education about the usability of collaborative technologies, eg video conferencing, Skype, Evo, IM chat etc.

TOR (5): Principles and strategies for supporting international research engagement.

Issues Impeding International Research Collaboration

In TOR (4) the shortcomings of the current Australian system with respect to international research collaboration are outlined. In summary:

- The emphasis in Australian funding programs on the requirement to demonstrate national benefit for Australia may be inadvertently impeding international collaboration. Recognition of the benefits of international collaboration in achieving priorities could be identified more explicitly within funding rules and guidelines.
- Australia's joint bilateral funding programs are scarce and the countries selected for relationships with Australia are limited.
- The existing bilateral funding programs have a requirement to apply to two separate funding schemes for the one project. The separate application process leads to a lack of coordination, separate peer review and inconsistent outcomes for the participants.
- There is little engagement with peak industry bodies to promote links between Australia's academics and international companies.
- Australia's research strengths are not showcased on a global scale.
- There are inherent barriers to international researchers moving to and from Australia (particularly for early to mid-career researchers). For example, immigration procedures, complex taxation arrangements, perception that obtaining a suitable position on a return from overseas will be difficult, financial and cultural barriers.
- There is little opportunity for Australian researchers to take leadership roles in international projects or for overseas partners to take leadership roles in Australian research projects.
- There is limited funding available to attract high quality international research students to Australia.
- Advice and assistance in applying for and meeting the obligations of international research funding is lacking.
- Where funding support is available for international collaboration it requires an over-heavy administrative burden and has little flexibility.

Addressing the shortcomings - Summary of Key Recommendations:

The University of Melbourne recommends to the Inquiry that:

1. An overview of Australia's research involvement with other countries, across all disciplines, and a coordinated approach and a single point of contact needs to be provided
2. A clear international strategy needs to be articulated to enable Australia to reach the forefront of international research
3. New funding models be introduced to ensure long-term strategies are in place to enable Australia to prosper in the global context. Rather than have international collaboration embedded within

other funding schemes, there needs to be a distinct pool of money for international collaboration, with funding available in the following areas:

- Seed Funding
 - Major bilateral initiatives
 - Support for European Commission FP7 applicants
 - Partnerships with International Industry
 - Fellowships
 - Scholarships
 - Infrastructure
4. Increased flexibility needs to be applied to the eligibility criteria of major Australian funding bodies to enable overseas investigators to participate more fully
 5. Education links with other countries should be used to improve research collaboration
 6. Visa, compliance and ethics issues that impeded successful collaboration need to be addressed
 7. Coordination of the major stakeholders in international research collaborations needs to be improved and where possible a national help-desk introduced to assist the process.
 8. Increased support for the administrative requirements of international applications should be provided by expanding the role of FEAST and introducing a similar service for North American funding opportunities
 9. The possibility of launching international offices to facilitate collaborative research should be considered
 10. A clear marketing plan to promote Australia's research strengths on a global scale needs to be produced

The key principles which should be guiding the strategy to international research collaboration are:

- Investment in the next generation of researchers to enable effective participation in global engagement
- Nurturing high quality research students (local and overseas)
- Removal of obstacles to collaboration for researchers and students, and supporting enabling activities
- Facilitate researcher access to data, skills and facilities both in Australia and overseas
- Promotion and maximisation of the impact of research in Australia

It is within this context that the following recommendations are made:

Recommendation 1:

There needs to be an overview of Australia's research involvement with other countries, across all disciplines, and a coordinated approach and a single point of contact needs to be provided. A resource that provides information on Australian research funding bodies activities and support for research, training, knowledge transfer and public engagement, as well as their role in delivering the Australian Government's research objectives. A good example of this being done well overseas is the role that the Research Councils UK (RCUK) body plays. (<http://www.rcuk.ac.uk/default.htm>)

Recommendation 2:

The Australian Government, and its associated funding bodies, need to have a clear international strategy to help Australia reach the forefront of international research by way of, investing in collaborative research, infrastructure, international postgraduate students, fellowships, networking and travel awards to promote collaboration.

This strategy needs to address, among other things, the following objectives:

- Advancement of collaboration between Australian researchers and the best researchers in the world
- Support for the mobility of high quality researchers to and from Australia
- Support for the recruitment of high quality research students
- Opportunities for Australian researchers to access technical data and knowledge, and world class facilities
- Showcasing of Australia's research strengths on a global scale.

Recommendation 3:

The current funding base to support international research engagement needs to be reviewed in order to enable the best possible outcomes for international research engagement. New funding models need to be introduced to ensure long-term strategies are in place to enable Australia to prosper in the global context. Although there are funding schemes available, the limited amount of funding means that a significant number of high quality and worthwhile proposals remain unfunded.

Rather than embed international collaboration within funding schemes, there should be a distinct pool of money for international collaboration, with funding available in the following areas:

- *Seed funding* or small project funding that allows researchers to trial international collaborations and/or run seminars around a particular topic
- *Major bilateral initiatives* with targeted regions involving one joint application, assessed once only by a panel from both countries, with funds to match from both sides. Funding needs to include research costs, as well as travel and living expenses, and be for at least 2 years, to have time to build a collaboration. There needs to be a government funded body or organisation that removes obstacles to collaboration by, for example, signing memoranda of understanding with research funders in other countries. By having such MOUs, there can be assurance that projects are assessed under a single peer review systems when funded by more than one organisation. There are current examples of successful bilateral arrangements in place, for example the Australia-India Strategic Research Fund, which is a joint initiative of the Australian and Indian governments, however the dual application process still applies here.
- *Support for European Commission FP7 applicants* – The NHMRC has a funding pool of \$2m per annum to assist medical researchers participate in projects with international researchers that have been selected for funding under the *European Union Framework for Research and Technological Development Seventh Framework Programme (FP7)*. There needs to be an equivalent fund for non-medical participants, and the amounts need to be increased. A successful peer-reviewed competitive proposal funded by an overseas agency should be eligible for matching support from an Australian agency without significant additional review.
- *Partnerships with international industry* – to maximise the value of Australian research, there should be further promotion of potential links between international companies and Australian academics (including industrial researchers), with bodies such as Austrade being used as a source to direct foreign investment.
- *Fellowships* to be substantially expanded, particularly for early and mid-career researchers to support the mobility of high quality researchers to and from Australia – allowing both overseas and Australian fellows to spend substantial periods of time training both overseas and in Australia (similar to the NHRMC Overseas Fellowships). There is a need for special funds to support PhD graduates overseas. For example, in Germany the Humboldt foundation sponsors postdocs to get them around the world into the best labs. There are EU programs such as Marie Curie and the Spanish and Swiss Science Foundations which offer postdoc support also. This gives their postdocs invaluable training and, as greater than 80% of postdocs return to their home country, the ultimate

benefit is to bring back new ideas, new interactions and linkages and experience. These postdocs also form the cornerstone of long term collaborations. This provides an excellent platform for setting up robust collaborations, while enhancing the training of our graduates.

- *Scholarships* to attract high quality international research students. There is an explicit connection between education and the extension of international understanding, with many benefits flowing from a well-managed, high quality student experience and from wider and deeper education and research integration⁵. In a paper to the European Association for International Education in 2007, Forbes⁶. suggested at least four main drivers of the global competition for high quality research students:
 - Research students make a significant contribution to current research and development activities, either through their original contributions of intellectual property, or through the support they provide to the overall research groups to which they belong
 - After graduation research students provide essential expertise for knowledge economies
 - Research students provide the next generation of academic and research staff in universities
 - Research students can help facilitate collaboration among research groups.

From OECD data, as reported in Bradley's Review of Higher Education, 19.1% of all students in advanced research programs in Australian universities in 2006 were international students. Australia comes behind Switzerland, the UK, the US, as well as New Zealand, Canada and Belgium in the proportion of international students in advanced research programs⁷.

In order to increase the proportion of international research students in the tertiary sector, there needs to be a corresponding increase in the number of high value scholarships, also increasing the value and length of tenure to reflect the cost of living and average period of candidature of research training students, funded at a rate that allows students to participate without additional employment.

- *Infrastructure* – although the funding for this area is not technically under 'international collaboration' there needs to be continued investment in capital works and first class research infrastructure facilities in universities. In order to establish partnerships in which Australia can be a truly relevant player, even stronger infrastructure is required. Funding schemes such as NCRIS represent an important step forward but the amounts available are relatively small, and the route to achieve them complex, compared with overseas partners and competitors. Where local infrastructure is not available, support is needed for researchers to access facilities overseas. The possibility of further negotiation with other funding bodies to access their facilities, allowing time to be swapped in Australia's renowned facilities in exchange for access to theirs, should be investigated.

Recommendation 4:

Increased flexibility in eligibility criteria - the current eligibility requirements for chief investigators of schemes funded by Australian sponsors, particularly the ARC, need to be reviewed to enable more flexibility. Overseas researchers should be able to lead projects, and should not have to provide funding in addition to their time commitment on the project.

Recommendation 5:

⁵ The Nature of International Education in Australian Universities and its Benefits, Strategic Policy and Research in Education (SPRE) Ltd, 2009

⁶ Forbes D 2007 Research Student Mobility in a Competitive Global Knowledge Economy
<http://www.deanforbes.com.au/Site/Resmob.html>

⁷ The Nature of International Education in Australian Universities and its Benefits, Strategic Policy and Research in Education (SPRE) Ltd, 2009

Using Education Links to improve research collaboration – following on from the need for increased scholarships, there are several examples internationally of governments improving both education links and research collaborations simultaneously, which Australia should investigate. One example is the UK India Education and Research Initiative (UKIERI) <http://www.ukieri.org/>. This is a five year programme which aims to substantially improve educational links between India and the UK so that in the long term they become each other's partner of choice in education. It has been recognised as the programme that is playing an important role in fostering contacts across the UK and India in the field of Higher Education.

Recommendation 6:

Visa, compliance and ethics issues - immigration/entry barriers for researchers seeking to more to Australia or visit for extended periods need to be identified and dealt with⁸. In order to make engaging with Australia less complex, it should be considered whether the ethics requirement for international research can be relaxed, for example, by approving a list of eligible overseas organisations and their ethics requirements. To assist with the complexities of negotiating contracts related to international collaboration, a template overseas research collaboration agreement should be developed and circulated to key overseas funding bodies and institutions.

Recommendation 7:

Coordination of stakeholders - Increased coordination is needed between the Australian Government and associated funding bodies, universities, Academies, AusTrade, State and Local Governments, Embassies to promote the benefits of undertaking research in Australia.

Recommendation 8:

Support for international applications (and post-award issues). The Forum for European–Australian Science and Technology Cooperation (FEAST) is an organisation established by the Australian Government and the European Union to highlight, promote, and facilitate research collaboration between their respective communities, with the Secretariat hosted by The Australian National University on behalf of the research community. The role of FEAST should be expanded to provide services to assist university Research Offices with compliance and post award issues related to European Union grants and awards. Currently each individual university is faced with the challenge of meeting the many administrative and reporting obligations imposed by these grants, and it would be invaluable to have one point of contact to assist.

Similarly, there should be a body that provides such a service regarding North American funding for research and higher education. In particular, it would assist to have one point of contact to deal with the application processes (for example the use of grants.gov and the many individual on-line applications that universities need to navigate to make an application) and post award issues. It would be practical for the host of such a body to be one of the Australian universities.

Recommendation 9:

International Offices – consideration should be given to launching international offices to facilitate collaborative research in certain countries. The purpose of the offices would be to explain the Australian research system to overseas researchers and to explain the overseas research system to Australian researchers; highlight existing bilateral research collaborations; highlight opportunities for new collaborative research activity and publicise workshops and/or other events. Again, this has successfully been done by the RCUK, with International Offices in China, US and India (<http://www.rcuk.ac.uk/international/offices/default.htm>)

Recommendation 10:

Promotion – there needs to be clear document identifying Australia's areas of competitive strengths in research and a marketing plan to promote our strengths to overseas governments, institutions, and researchers. Australian research needs to be showcased on a global scale through relevant agencies, research and business communities and peak bodies.

⁸ Global Engagement Working Group Report to PMSEIC, December 2006

There is definitely a challenge to enhance global engagement whilst ensuring national priorities are met. Australia needs a strategy that addresses how we get the best value from partnerships with other countries, grasp opportunities to increase the level of global engagement and address those impediments that prevent us from taking advantage of such opportunities.