

Ideas Jam Challenge: Report

Executive Summary

The ACOLA Australia's Comparative Advantage Challenge was commissioned to seek input and ideas from across the full range of disciplines represented by Australia's Learned Academies and research agencies, to inform the 'Australia's Comparative Advantage' project under the Securing Australia's Future program. The Challenge was held from Wednesday 19 March to Wednesday 23 April 2014 (including a two week extension) to identify which strengths and weaknesses are likely to be most important for Australia's future comparative advantage, seeking insights from across the disciplinary spectrum.

The Challenge was made available for self-registration to all members of the four Australian Learned Academies, the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC). In total, 264 individuals registered. Participants were asked to respond to ten Challenge questions under the general theme of identifying potential sources of future comparative advantage and ways to address areas of weakness for Australia. Participants contributed to the Challenge by posting their own ideas, and adding comments and/or votes to ideas posted by others. Overall, the Challenge generated 58 ideas, 122 comments and 373 votes.

Of the total group registered, 98 (37%) contributed by posting ideas, comments or votes. This is lower than the Challenge-wide average participation rate of 55.5%, and may have been affected by late notifications to some target groups (e.g. ARC). In terms of participation, two thirds of contributors participated by voting (68%), with over half (54%) contributing only by voting or commenting (i.e. not posting ideas). This is slightly higher than the Challenge-wide average of approximately 40% contribution only by voting or commenting, and indicates that the group valued the opportunity to collaborate through expression of opinions on ideas posted by others.

The Challenge vote-to-idea ratio of 5.9 is just under the typical Challenge average of approximately 6.5 votes per idea. By comparison to averages across previous Challenge events, the ACA participant group had average commenting and voting levels, and high idea generation levels.

In other words, for the registrants who chose to participate, the collaboration style was relatively 'prolific' and 'interactive' (as opposed to 'cautious' and 'definitive' which can occur with groups dominated by engineering and/or technical mindsets). The strong level of ideation and interaction reflects the cross-disciplinary characteristics of the participant group.

The Challenge question that attracted the highest proportion of participant contributions was 'What factors could further support an active and excellent research and development and innovation system, including through collaboration?' with a total of 25 ideas, 70 comments and 161 votes. The idea resonating most strongly with the participant group, receiving the highest net popularity score of 18 through the voting process, was 'Innovation that doesn't require continued economic growth to produce outputs' (contributed by Ian Frazer).

A ranking of contributors by volume of content created, including weighted scores for ideas, comments and votes posted as well as votes received, identifies the Challenge's top three contributors as Denise AF, John Soderbaum and Dennis Trewin.

Summary of the Australia's Comparative Advantage Challenge

Challenge overview

The ACOLA Australia's Comparative Advantage Challenge was commissioned to seek input and ideas from across the full range of disciplines represented by Australia's Learned Academies and research agencies, to inform the 'Australia's Comparative Advantage' project under the Securing Australia's Future program. The Challenge was held from Wednesday 19 March to Wednesday 23 April 2014 (including a two week extension) to identify which strengths and weaknesses are likely to be most important for Australia's future comparative advantage, seeking insights from across the disciplinary spectrum.

In order to encourage contributions, theme questions for the Challenge were designed to be broad and inclusive, with a focus on seeking ideas and opinions from across the disciplinary spectrum represented by the target group.

Under the broad topic of identifying Australia's strengths and weaknesses and how these condition the building of our nation's future, ten specific questions were posed:

- What are the **major sources of national strengths** likely to condition the building of Australia's future?
- How can we **ensure suitable natural resource utilisation** including sustainable climate and environmental management?
- What factors could further support an active and excellent research and development and innovation system, including through collaboration?
- How can we **foster strong and independent institutions** that effectively enable social cohesion and equity and uphold the rule of law?
- What changes would help deliver a comprehensive skills, education and training system of standing on par with the world's best?
- How can we **promote effective regional development** including smart and sustainable settlement patterns?
- What would help us **achieve a well-functioning democratic political system**?
- How can we strike a **proper balance across resource-based, manufacturing and service activities** and ensure enhancement of their value add contribution?
- What major weaknesses can be addressed to allow Australia to take full advantage of relative national strengths?
- What **other perspectives and insights** are important for understanding the prospects for Australia's future standing?

Participants were asked to post their ideas, and vote and comment on ideas posted by others, in response to these ten questions. In total the ACOLA Australia's Comparative Advantage Challenge

generated 58 ideas, 122 comments and 373 votes (including positive votes or ‘Promotes’ and negative votes or ‘Demotes’).

Invitees

The Challenge was made available for self-registration to all members of the four Australian Learned Academies, the Australian Research Council and the National Health and Medical Research Council. In total, 264 individuals registered (see Appendix A for a full list of registrant details). The breakdown by organisational affiliation is shown in Table 1 below.

Affiliation	Number Of Registrants	Percent Of Registrations
Academy of the Social Sciences in Australia (ASSA)	18	7
Australian Academy of Science (AAS)	32	12
Australian Academy of the Technological Sciences and Engineering (ATSE)	47	18
The Australian Academy of the Humanities (AAH)	17	6
Other	150	57
TOTAL	264	100

Table 1: Registration by affiliation

Challenge Results

Figure 1 is a summary of the outcomes of the Challenge by theme question, popularity, and activity generated.

Contributions by challenge question

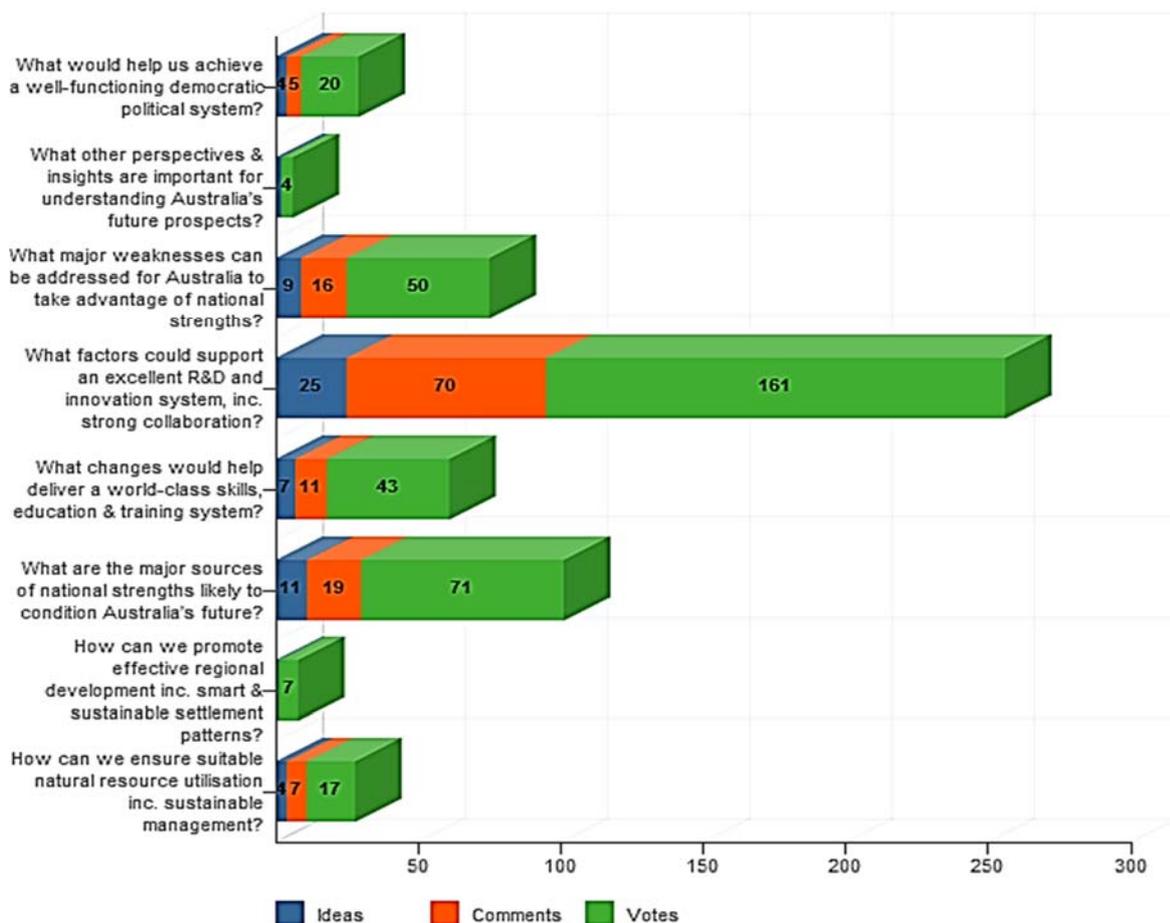


Figure 1: Ideas, Comments and Votes by Challenge Question

As shown above, the Challenge question that attracted the highest proportion of participant contributions was 'What factors could further support an active and excellent research and development and innovation system, including through collaboration?' with a total of 25 ideas, 70 comments and 161 votes. This concentration of activity may be due to the fact that this Challenge question reflect the concerns, interests and direct experiences of the participant group. It is worth noting that, in general, Challenges are most successful when directed at future-oriented theme questions, as is the case here, as opposed to surveys which capture people's views on current or past circumstances.

Top ideas by popularity

Table 2 shows the top five ideas posted during the Challenge by group-voted popularity.

Idea Title	Posted By	Promotes	Demotes	Net Score	Comments
Innovation that doesn't require continued economic growth to produce outputs	Ian Frazer	18	0	18	11
Send them all out...and get them back again!	Michael Milford	17	0	17	10
Long term R&D at arms length from government	John Soderbaum	17	1	16	12
Reduce the burden on collaboration with overseas partners	Matt King	15	0	15	4
A silicon valley model for Australia	Selena Bartlett	13	0	13	7

Table 2: Top five ideas by popularity

Top ideas by activity

Table 3 shows the top five ideas by activity generated, across ideas, comments and votes (whether positive, negative or 'no opinion' votes).

Idea Title	Posted By	Promotes	Demotes	Comments
How to get more from our Universities	John Day	13	4	12
Innovation that doesn't require continued economic growth to produce outputs	Ian Frazer	18	0	11
Long term R&D at arms length from government	John Soderbaum	17	1	12
Send them all out...and get them back again!	Michael Milford	17	0	10
An ARC small grants scheme?	Dan Svantesson	13	1	8
A silicon valley model for Australia	Selena Bartlett	13	0	7
Reduce the burden on collaboration with overseas partners	Matt King	15	0	4

Table 3: Top five ideas by activity generated

Summary of the top ideas by popularity (P) and activity (A)

Innovation in health care management (P&A) - Innovation that doesn't require continued economic growth to produce outputs - an idea that promises a high return on investment is **Ian Frazer's idea (D126)**¹. The plan is to prevent sickness by creating a system that encourages healthy living through rewards and adopts advances in health care management faster. The benefit is preventative care is less expensive than reactive care and it saves more lives.

Protecting and preserving Australian Intellect (Michael Milford D127) (P&A) - and removing intellectual isolation. The idea proposed is a Pro-active temporary brain drain – where promising young researchers in Australia should be strongly encouraged and supported to spend significant periods of time in top international institutions, in parallel with the following scheme which ensures we get them back through Future Fellowships and further encouragement of institutions of regular and significant overseas research placements (especially for younger faculty academics with less family / other commitments) should be encouraged.

Fostering Innovation (P&A) – a plan that would foster more innovations is **John Soderbaum's idea (D128)**. Its implementation would lead to faster approval for research grants and a larger resource of academics to draw ideas and innovations from. This is an opportunity to create a more open environment for new ideas and collaboration. The benefit is it will attract more researchers to come to Australia from other countries or work with Australians from abroad and contribute innovations more quickly.

Reduce the burden on collaboration with overseas partners (Matt King D129) (P&A) - one of the barriers to collaboration with overseas researchers is the burden on overseas project partners on ARC grants is disproportionate to experiences with other national grants programmes. Letter of support is the norm internationally, with short CV. With Australia however, the process for the overseas collaborator is a cumbersome and multiple steps in an RMS system that is complex. The solution is to simplify the norms and improve the system to reduce burden on overseas partners in order to make collaboration attractive for the overseas partners.

A silicon valley model for Australia (Selena Bartlett D131) (P&A) - Innovation, technological advances and businesses are driven by people taking risks and the recommendation is that as a nation we need to support risk takers, develop a culture that rewards risk taking and to attract the Australian risk takers back from Silicon Valley by providing real tax incentives to angel investors, early stage venture capital and start-up companies and individuals taking the risks with their own capital. It is imperative we support potential revenue generating future ventures.

How to get more from our Universities (John Day D137) (A) - our universities perform well according to the Excellence in Research for Australia (ERA) system. However, that method of measurement does not encourage universities to deliver research impact in our industry, therefore failing to deliver as much benefit to Australia as they might otherwise. The solution could be that the government needs to reward universities that achieve significant impact and also provide attractive R&D tax concessions to industries that fund university research. By promoting a positive cycle in

¹ The alpha numeric reference along with the name of the contributor in brackets, is in reference to the excel sheet cell number which contains the details of the transcript.

which academics develop more focus on industry, delivering more research impact, thus justifying attractive tax concessions for industry funding of the universities, the economic spin-off could be profound.

A new category of ARC small grants scheme (Dan Svantesson D132) (A) is suggested to for some disciplines such as humanities and social sciences for projects that require lower levels of funding than is catered for by the Discovery scheme and others resulting in better value for money. The idea also suggests considering increasing the relevance of 'value for money' as a component in the assessment of applications.

Ideas summary by questions

In summarising the numerous ideas and comments we have only drawn attention to popular (voted or commented) ideas here. The complete transcript of the Ideas Jam Challenge is available as an annexure to this report.

The question that saw the most responses is **what factors could support an excellent R&D (research and development) and innovation system, incorporating strong collaboration?**

Challenge participants who addressed this question suggested either improving current systems for grants, procedures for collaborating with overseas institutions, and alternatively creating new institutions to deal with funding and collaboration with international partners. Out of the twenty respondents only three proposed that something new be created to deal with research and development and international collaboration. The rest of the respondents recommended improvements to existing systems for evaluating grant applications, international collaboration, industry and university collaboration, and structuring funding for grants.

The ideas/comments for the creation of a new system or entity were to **add tax concessions (John Day D137)** for industry that funds university research, **create a body or bodies (John Soderbaum D75) "at arm's length" from government** that would receive guidelines for approving applications for grants from government and set its own specific priorities for research outcomes, and create a program to send students and young academic faculty to international institutions that would lead to collaborative publications and grant applications.

A theme that runs throughout the responses to this question are proposals to **remove bureaucratic obstacles (Steven Praver D129)** for smoother grant approval and grant funding. Also recommending alterations to the procedures academia must adhere to in order to collaborate with industry and with international institutions for more efficient and smoother interactions. These proposals attempt to provide adjustments to the world of academia that allow for more Australian creativity and innovations.

The second most frequently answered question that generated nineteen percent or eleven of the fifty eight ideas is: **what are the major sources of national strengths likely to condition Australia's future?** The idea with the highest amount of votes (18) in the Jam survey was created by **Ian Frazer (D126)**. Ian suggests creating a national strength as an option instead of relying on an existing one. He asked that Australia focus on innovations to health care that deliver social benefits without requiring economic growth. For example, develop programs that encourage early evaluation and

early universal adoption of innovations in health management and effective educational programs that reward “healthy living”.

One theme that dominates this question is the call for **new approaches**, these are ideas that are general in nature and attempt to prepare Australia for the rapidly changing global environment. For example, responders ask that Australia **take advantage of its multicultural population (Peter Laver D139)** for international collaboration with researchers and make recommendations that the country take advantage of the geographic location of the country for improved strategies with international business partners.

A more specific proposal put forward was to build on the already existing mineral extraction and export business and start **manufacturing higher value metal alloys and steel (CC D134)**. The ideas provided comment on the adaptability of Australia in the cultural, geographic, and natural resource areas.

The third most popular question that generated fifteen percent or nine of the fifty eight ideas is: **what major weaknesses can be addressed for Australia to take advantage of national strengths?** The reactions to this question address cultural, environmental, and academic weaknesses and attempt to turn those shortfalls into strengths. For example, Australia has a weak resource of people that are multilingual in relevant Asian languages. Therefore the country could **recruit its available multicultural population (Cliff Hooker D130)** to immerse children from ages one to seven in a variety of Asian languages to adapt to the rising influence of Australia’s neighbours. Another respondent prescribes that Australia **secure and maintaining our enviable biosecurity status (Martyn Jeggo D145)** in order to protect the country’s livestock and natural resource exports. A solution proposed to address Australia’s loss of young academics to international institutions is that the old nine to five work schedule should give way to flexible work hours that can be adjusted to different researchers’ schedules.

The fourth most answered question that received twelve percent or seven of the fifty eight ideas is: **what changes would help deliver a world class skills, education & training system?** The proposals put forth for the above question cover changes to university structures and adding or changing curriculums for schooling before entering the universities. The changes suggested for universities are **An accreditation system for online educational resources (Nicolas Cherbuin D174)**, **Facilitating academic research through streamlining the research funding (Michelle Hill D133)**, and adapt undergraduate and master’s degree time frames to match the rest of the world and **abandon the honours year in favour of a more internationally-compatible model (Marine Scientist D166)**.

The changes suggested to curriculums for schooling before entering universities range from encouraging young students to value risk taking with a **silicon valley model for Australia (Selena Bartlett D131)** all the way through undoing parochialisms and **adopt a national curriculum (Cathie Doherty D167)**, and Connecting Knowledge in Education and Research by teaching a modern, science-based Universal History called the **Big History Project (David Christian D156)**.

The changes recommended for the universities are to increase efficiency in completing undergraduate schooling, **reenergising TAFE colleges’ and shifting their focus** from a commercial focus to a public one(**Cathie Doherty D143**), and make it easier for Australian students to study

abroad and for international students to come and study in Australia **with a more internationally-compatible model (Marine Scientist D166).**

The next question generated seven percent responses and it asks: **how can we ensure suitable natural resource utilisation incorporating sustainable management?** The ideas put forth for this question range from **changing focus from natural gas to cheap brown coal (David Brockway D179)**, and setting a **conservative population target (George Jackson D157)**, to **introducing an emissions trading scheme (Marine Scientist D141)**. These proposals offer possible ways to reduce greenhouse emissions and remain competitive, shift to brown coal which is cheaper than natural gas, and a general caution to not over populate Australia.

The last three questions generated ten percent or six of the fifty seven suggestions and they are: **what would help us achieve a well-functioning democratic political system?** The following ideas cover corruption and long term strategic planning for the improvement of democracy. The three ideas that address this question cover the removal of corruption through **eliminating corporate political donations (Kate Stacey D158)**, recognising Australia's growth as a sign to **start structuring the government like a "big country" (Matt King D153)**, and **expanding Senate's ability to select committees for long term strategic planning (Peter McPhee D142)**, the need for **a more direct policy involvement by social science and the humanities** is another valuable idea with a suggestion to create the office of the **Chief Social Scientist** who could emerge as a vital knowledge broker across disciplines, sectors and policy. **(Ann Moyal D161).**

The question that generated two of the six responses was: **what other perspectives and insights are important for understanding Australia's future prospects?** The two ideas cover economic and environmental preparation for the future. The first idea is that Australia needs to prepare for the possibility of a **mega-drought (Matt King D173)** which has a low probability but would have a high impact. The second idea is that Australia needs to **pick "winners"** as a vehicle for choosing public policy for which natural resources to focus on for the future **(John Roberts D175).**

The last question with just one answer **how can we promote effective regional development incorporating smart and sustainable settlement patterns?** The idea proposed is to develop the **Developing Northern Australia – sustainably, especially in terms of agriculture.** There needs to be intensive research to see what crops would be successful and how developing the land would affect rural communities and indigenous people **(Andrew Smith D147).**

Harnessing local skills and Asia literacy- an innovative idea that would prepare Australia for the rising influence of its neighbours is **Cliff Hooker's idea(D30).** The people in this country who speak the same languages as the countries Australia does business with are an unutilized resource. The long term benefit of this idea is it would prepare Australia's future leaders to interact more intelligently with our neighbours. The short term benefit is that unemployed people will have jobs and those jobs will strengthen our communities.

Creating value through the resources boom - Australia needs to add value to the resources we mine by converting them into raw metals and alloys, this is **CC's idea(D170).** The minerals we mine are not being utilised to their full potential. Once we do properly take advantage of our resources the benefits will be more jobs and value added to the minerals that we currently export and then import as more expensive manufactured goods.

Conclusion

In conclusion, drawing attention to the top five voted ideas, one can see that the most ideas contributed to the challenge are those that offer seemingly simple solutions to complex challenges. These ideas call for the removal of impediments to innovations, the implementation of cost saving plans, and the utilisation of untapped resources. These ideas could be pointing towards logical solutions to Australia's academic, cultural, and economic challenges. More importantly, these ideas, if explored, benefit Australia more in the long term.

The important question for the project and the nation however, is what do we do in the future to reduce, eliminate or improve the situation that exists. Some of these ideas could provide answers and solutions if developed further and taken cognisance of at the time of developing policies that will drive Australia's future.

Annexure: Transcript of ideas that received five or more votes

Challenge Question	Idea	Created By
What are the major sources of national strengths likely to condition Australia's future?	<p>Innovation that doesn't require continued economic growth to produce outputs</p> <p>In health, the problems are 1) the increasing use of resources to maintain a healthy ageing population and 2) a current economic model that requires continued growth and consumption to drive the economy. One solution is to focus on innovations in health care that deliver social benefit without requiring increased consumption of resource. Examples would be development of effective education programs that encourage and of social structures that reward 'healthy living'. These would be marketable as cost saving interventions. Another solution would be to develop programs and tools that encourage early evaluation and early and universal adoption of innovations in health management that are more cost effective than the current dominant paradigms.</p>	Ian Frazer
What factors could support an excellent R&D and innovation system, inc. strong collaboration?	<p>Send them all out...and get them back again!</p> <p>A young but wise person pointed out to me years ago that brain drain is not a problem per se and is actually a good thing. Its <i>*permanent*</i> brain drain that is the problem, where people don't ever come back! Australian researchers (especially young, Australian-born researchers) face the rather horrible issue of intellectual isolation. We go overseas to conferences, meetings, even sabbatical - but then we come back again (maybe) and it's just not the same as physically sitting in the same space as our overseas collaborators. And many young promising academics never get this chance to go overseas in the first place.</p> <p>I put forward a suggestion here for two measures to more strongly implement:</p> <p><i>* Pro-active temporary brain drain *</i> Promising young researchers in Australia should be strongly encouraged and supported to spend significant periods of time in top international institutions, in parallel with the following scheme which ensures we get them back!</p> <p><i>* Get them back *</i> I understand the nominal aim of schemes such as the Future Fellowships is to attract back top Australian talent. I think further encouragement of institutions of regular and significant overseas research placements (especially for younger faculty academics with less</p>	Michael Milford

	family / other commitments) should be encouraged. A well-designed 6 month stay should result in many KPIs for the academic's institute - collaborative publications, grant applications etc... M	
What factors could support an excellent R&D and innovation system, inc. strong collaboration?	<p>Long term RD&D funding at arm's length from government</p> <p>Problem: Stop-start funding for RD&D and insufficiently strategic approach to support for RD&D</p> <p>Solution: Provide funding through a body or bodies that are at arms length from government. Ensure funding for the body is provided for long periods time (say 10 year periods). Ideally have bipartisan support for model. The funding body should determine RD&D priorities within broad guidelines set by government. Projects that deliver on expected outcomes eligible for more funding, those that don't are stopped.</p> <p>Benefits: Research programs that are better targeted to address identified needs/priorities. Appropriately scaled support for projects (subject to them delivering agreed objectives). Confidence that projects (if delivering on their objectives) can access funding support in the long term and thus transition along the innovation spectrum.</p>	John Soderbaum
What factors could support an excellent R&D and innovation system, inc. strong collaboration?	<p>Reduce the burden on collaboration with overseas partners</p> <p>The burden on overseas project partners on ARC grants is disproportionate to experiences with other national grants programmes. Letter of support is the norm internationally, with short CV. With Australia, they 1. Register with RMS 2. Click on a link 3. Wait 1-2 days for a password 4. Log in and find their Person ID 5. Send to lead CI 6. Click link to join the project 7. Fill in personal details 8. Complete 5 documents for their research track record. 9. Sign a certification form (despite having clicked a link to agree to participate!) Solution: Improve system, reduce burden on overseas partners to make collaboration attractive.</p>	Matt King
What major weaknesses can be addressed for Australia to take advantage of national strengths?	<p>A practical route to multilingual Australia</p> <p>Australia produces only tiny numbers of multi-lingual speakers at a time when its need to engage insightfully with its own immigrant communities and with its Asian neighbours is great and pressing.</p> <p>Research indicates that facilitating very young children (1 - 7) to learn languages through</p>	Cliff Hooker

immersion play is the most effective and efficient way to produce multi-lingual brains. But this is currently the age group in which Australia does least language learning. Which second language is learnt matters less than learning one, but tonal languages have additional advantages in music and elsewhere. Immigrants who speak their own language at home and English at pre-school and school already satisfy this requirement, but the majority of children miss out. This is unnecessary. Australia has more than 100 languages spoken at home by native speakers, in particular by mothers, many of whom have no job and no ready status in the community. They can be recruited to conduct immersion play sessions in pre-school and years 1-3 of school,, under trained teacher supervision, with positive outcomes for everyone. Overseas experience suggests that as little as 2 hours per week will, across the early years, form an adequate basis for bilingual learning, provided immersion is achieved (not grammar instruction).

Australia has one of the most constructive multi-ethnic cultures in which there is a good degree of mutual acceptance, respect and trust among sub-cultures. This provides a basic positive context for the educational process.

The outcome would be an Australian culture with much stronger ties among sub-cultures, with a much stronger capacity to engage insightfully and constructively with their neighbourhood and world. These outcomes are no more than many nations have achieved for decades past.

<p>What changes would help deliver a world-class skills, education & training system?</p>	<p>A silicon valley model for Australia</p> <p>1. Innovation, technological advances and businesses are driven by people taking risks and not by governments determining what innovation is and providing excessive regulations that stifle innovation. As a nation we do not support risk takers. Our ideas are given away or sold off before the greatest value has been added because there is no capital to support them.</p> <p>2. Starting in primary school through to University, students need to know that it is essential for Australia's future that we take risks. It takes time to develop a culture that rewards risk taking. Singapore has successfully implemented these changes starting in kindergarten. We need to attract the Australian risk takers back from Silicon Valley by providing real tax incentives to angel investors, early stage venture capital and start-up companies and individuals taking the risks with their own capital. It is imperative we support potential revenue generating future ventures, we have no choice. Mining is a limited resource and medicine is an expense centre not a revenue generating centre for the nation.</p> <p>3. We have to innovate in the technology space to support the new information age, for example in digital health, social media, and information technology and start-up businesses. Silicon valley has developed a successful innovation model that we can adopt. Australia has very smart and educated people working in regulation and administration that is in risk mitigation rather than risk taking jobs. There are 50,000 Australians living in the Bay Area alone. They leave Australia to get capital to develop their ideas and grow their businesses. We need to support and grow them in Australia to support the next 10 generations of people.</p>	<p>Selena Bartlett</p>
<p>What factors could support an excellent R&D and innovation system, inc. strong collaboration?</p>	<p>An ARC small grants scheme?</p> <p>Obtaining research grants is (perhaps unfortunately?) an important factor in modern academic life. And for obvious reasons, the larger the grant amount, the greater the perceived success. This may cause inflated budgets &ndash; in a perverse sense, the more expensive you can make your research endeavour the better. Certain disciplines clearly require large grants for the purchase of equipment etc. However, I suspect that, at least for some disciplines such as humanities and social sciences, a lot could be gained by introducing a new category of ARC grants for projects that require lower levels of funding than is catered for by the Discovery scheme and others. Where smaller amounts are handed out to each successful application, a higher success rate could be catered for which may motivate applicants to tailor their applications towards that category instead of the Discovery category resulting in better value for money (I realise, however, that there is an increased administrative burden for the ARC attached to this). It may</p>	<p>Dan Svantesson</p>

	<p>also be worth considering increasing the relevance of 'value for money' as a component in the assessment of applications.</p>	
<p>What changes would help deliver a world-class skills, education & training system?</p>	<p>Facilitating academic research Problem: University academics perform both teaching and research, but recent funding cuts means academics are wasting a lot of time on applications which are not funded, leading to reduced time on teaching, research training and actual research. Solution: 1. Discipline-dependent, basic level of funding for research for all academic appointments. 2. Streamline application procedures to minimise time spent on grants that will not be funded. For example, only write the budget and budget justification after the project has been shortlisted for funding. Benefit: Reduce time wasted on completing applications. Allows all academics to actually have time for teaching and research training with a level of funding sufficient for training postgraduate research students.</p>	<p>Michelle Hill</p>
<p>What are the major sources of national strengths likely to condition Australia's future?</p>	<p>A first world country with a third world economy Australia's natural mineral resources represent one of her greatest competitive advantages. In the past, these resources had been mined and value added by converting them into raw metals and/or alloys, and in some cases, then into components via the manufacturing industry. This value adding through the manufacturing industry has continually been decreasing for the past 20 years and is especially in the public eye currently with the exit of major car manufacturers. I have heard several international colleagues refer to Australia as a first world country with a third world economy. Of course this is a great exaggeration, but their point is that we no longer add value to what we have in abundance and are forgoing taking the maximum advantage of our greatest competitive advantage, our minerals. There are very good reasons for the decline of components of the manufacturing industry and these are not easily remedied. From the 1800's</p>	<p>C C</p>

until around 2005 the 'real' cost of metals and alloys was continually decreasing (see figure). Since 2005, these real costs are increasing, and increasing rapidly. Australia has much to gain from her natural resources in the coming 50 yrs. if she can value add to a significant portion of these minerals by converting them, at least to metals and alloys, and even better if it can be taken to the engineering component stage. The problem is how to do this. Within Australia exists a world class alloys and metals community? It is well known internationally because the world's biggest manufacturers seek them out to perform research. This is especially well known at Swinburne University in the domain of extractive and process metallurgy, and at Monash University and Deakin University in Victoria and University of New South Wales in the areas of downstream metals processing and engineering alloy development. Australian researchers of this calibre decided to settle and do research in Australia because they want to contribute to the Australian effort and I am sure there is tremendous good will from them to help our minerals and metals community value add. I would like to see a co-ordinated national effort that brought together the very best of our university researchers, CSIRO, and our miners to identify means to economically value add further to our minerals by converting into metals and alloys, as Australia once did to a very significant degree. It would make sense for organizations such as DSTO to provide input to such an effort. The payoff will not come immediately, but as real commodity prices continue to grow this is an industry that can underpin further growth in the Australian economy for the next 50 yrs. Emphasis should not initially be the low cost grades of metals and alloys that low wage countries such as China and India can make in abundance. But rather the high value added, high cost grades of steel, Aluminium alloys, Copper and Brasses, Nickel that require the level of expertise Australia is capable of contributing.

<p>What factors could support an excellent R&D and innovation system, inc. strong collaboration?</p>	<p>Development and translation requires as much research as 'research' Problem: Too much emphasis is placed on 'pure' and 'basic' science and not enough on translational research and engineering. Almost all research grants are awarded to fund exciting new projects which may be very high risk (as they should be), with equally large rewards if successful. At the other extreme, funding for translational research (NHMRC Development, for example) only funds research which is very, very close to being commercial viable. ARC Linkage is even more confused, as it expects companies to fund basic science which may be too high risk for them; however, companies are more likely to invest in research which aims to translate existing discoveries into saleable products. There are often many practical questions which must be answered when developing a technology to the point of being marketable. This break in the technology development path from proof-of-concept to product is lacking in Australia. Solution: We should fund translational research within the universities, without the need to create spin-out companies when the technology is too underdeveloped to be successful or to be attractive to a potential investor wishing to licence the intellectual property. Benefit: Many more great ideas will be realised into products and services, rather than stopping after a few publications are produced around pilot studies and proof-of-concept testing.</p>	<p>Stephen Redmond</p>
<p>What factors could support an excellent R&D and innovation system, inc. strong collaboration?</p>	<p>Understand barriers to creating new successful companies To grow the economy we need to grow companies. By understanding the barriers that people face in setting up a new company, we may facilitate this growth. I suggest we ask successful companies, particularly new Australian based companies, what were the barriers that they had to overcome, how did they do it, what was the most useful advice they received on the way. Amongst companies I know, some have said it was cheap access to pilot plant equipment, for others it was 'angel investors' who understood the timeframe required to get the company on its feet, for others it was the difficulty of accessing technology. I imagine that the barriers and facilitators are different for different sectors. I also believe that such a survey may have been done in the past for the biotech sector.</p>	<p>Adrienne Clarke</p>

<p>What factors could support an excellent R&D and innovation system, inc. strong collaboration?</p>	<p>How to get more from our Universities Our universities perform well according to the Excellence in Research for Australia (ERA) system. However, that method of measurement does not encourage universities to deliver research impact in our industry. Therefore our universities fail to deliver as much benefit to Australia as they might otherwise. We do not benefit from all of that knowledge and capability to the extent that we should. We need to do two things. Firstly, government needs to reward universities that achieve significant impact. Secondly government needs to provide very attractive R&D tax concessions to industries that fund university research. At the moment the R&D spend by industry is very large, but only a tiny % is spent in the Universities. This link needs to grow. We need to promote a positive cycle in which academics develop more focus on industry, delivering more research impact, thus justifying attractive tax concessions for industry funding of the universities. The economic spin-off could be profound.</p>	<p>John Day</p>
<p>What are the major sources of national strengths likely to condition Australia's future?</p>	<p>Build on our excellent reputation for Medical Engineering Several overseas visitors have recently asked me why Melbourne is pre-eminent in Medical Engineering. On further questioning they were specifically referring to our long track record in scientific instrumentation and were puzzled to know that this had almost nothing to do with our large publically funded health research institutions. The 40-year history of companies such as Varian, Invetech, Vision Biosystems, SGE has created a talent pool that has started to form the next generation of companies, and these players are all internationally focused and export driven. Product Development and Manufacturing in this area is highly skilled, high value-add, innovative, protected by strong IP and has a regulated stability not found in other fast moving consumer goods. The danger for us is that we do not recognise this international strength that others have spotted, therefore we are not re-inforcing the brand and reputation. With public funding support we have shown that it is possible to build an international brand that is beyond individual firms. Examples include tourism, wine and sport. Our emerging technology players are small and fragmented, focused on building a position in the international supply chain, and therefore unlikely to build the sector brand on their own. If we don't realise we are winners in these areas then how can we proclaim this to the rest of the world? We need to build a collective vision for what our manufacturing future looks like, then unite to reinforce this vision internationally.</p>	<p>Erol Harvey</p>

<p>What are the major sources of national strengths likely to condition Australia’s future?</p>	<p>Australian culture is a major national strength Entered on behalf of Alexander Gosling “Much is made of the competitive threat we face from regional low cost nations such as China, India, Thailand, Malaysia, Indonesia. These countries have a hierarchical culture in which e.g. the boss is always right, your teacher is hugely respected and assumed to be omniscient, and the important thing is to do as you are told, show respect, and don't make mistakes - an obvious contrast with the Australian egalitarian, "can do, have a go", I'm as good as the next guy culture. Clearly, the latter is much more supportive of maximising any individual's capacity to solve tough problems, create breakthrough concepts and generally be original and innovative. This cultural advantage is further supported by our diversity of ethnic and racial backgrounds and our general tolerance of such differences. From practical experience I have discovered this to be so many times, i.e. that technological innovation of a practical nature is much more easily achieved in Australia than in countries to our north. So what? We need to make sure we exploit this natural advantage by supporting businesses and industries in which we gain leverage from it, an obvious example being high-tech, high margin manufacture where proximity and close linkage between conception, development, engineering and production are essential to success.”</p>	<p>Peter Laver</p>
<p>What factors could support an excellent R&D and innovation system, inc. strong collaboration?</p>	<p>Account for the full cost of research 1. The true cost of research at Australian Universities is not currently met by the 'block grant' system. Consequently, research grants typically are a net drain on a University's bottom line, much of the research is subsidised by income from teaching, and low-cost, desktop based research is favoured over costly laboratory or field-based research. 2a. A solution is to adopt a US-style approach, whereby 'overhead' costs are added to each research grant, at a rate determined by each university. 2b. Another solution is to increase the amount of the block grants such that they cover the full costs of research 3. The US approach provides a more transparent link between research grant income and the overhead costs associated with that research. Both approaches have the benefit of funding the full cost of research, both direct and indirect.</p>	<p>Marine Scientist</p>
<p>How can we ensure suitable natural resource utilisation inc. sustainable management?</p>	<p>Introduce an emissions trading scheme The carbon tax was a good start, and could have been a great example of Australia leading the way on climate change. Abbott is now repealing the tax. We should replace it with an emissions trading scheme, a proven means of reducing emissions and maintaining competitiveness.</p>	<p>Marine Scientist</p>

<p>What would help us achieve a well-functioning democratic political system?</p>	<p>Longer-term perspectives in government 'The Lucky Country' is mired in short-term party politics at a national and state level and between the two levels. Political life has become a football match. Not only issue of national importance is being focussed on in a bipartisan way to endure an optimal outcome. The paucity of imaginative and visionary leadership is both cause and effect. The role of Senate select committees should be expanded to position them as engines for developing strategic planning choices about key future issues as much as being about 'review' in the interests of embarrassing the government.</p>	<p>Peter McPhee</p>
<p>What changes would help deliver a world-class skills, education & training system?</p>	<p>Treasure TAFE Australia has a network of TAFE Colleges that have borne the brunt of crude policy experiments in marketization on a regular basis, and had the stuffing knocked out of them over the years. I suggest we re-invest in TAFE colleges as key public institutions and re-energise them and their programs as a crucial part of workforce strategy. As public programs, they will be more amenable to strategic planning, and long term visioning, rather than leaving it to opportunistic reactive programs offered by the for-profit sector. There is a place for both, playing to their strengths.</p>	<p>Cathie Doherty</p>
<p>What major weaknesses can be addressed for Australia to take advantage of national strengths?</p>	<p>Using Australia's energy resources for a broader national benefit Provision of high quality energy services is the life-blood of a modern economy. With the exception of crude oil, Australia is blessed with an abundance of non-renewable and renewable resources. Australia's strategic perspective on the benefits that can flow to society and the economy as a whole from its resource riches has been very weak - witness the current issues surrounding east coast gas supply, which is not exactly unforeseen. In the face of the of climate change and the potential for some of our carbon based assets to become stranded, we need a serious and ongoing policy debate and long term strategic planning about how to get the best overall economic and environmental return for the nation as a whole from all our resources, whilst starting on the long term energy transition that is required of every country in the face of the climate threat. Only in this way can we provide the necessary guidance for efficient use of the investment dollar for the optimal outcome for Australia as a whole.</p>	<p>Trevor Powell</p>

<p>What major weaknesses can be addressed for Australia to take advantage of national strengths?</p>	<p>Maintaining our enviable biosecurity status Australia has globally unique position in freedom from diseases that affect livestock and to a lesser extent plants and humans. This provides a considerable advantage in terms of international trade in livestock and livestock products and considerable saving in terms of managing the risks and costs of disease outbreaks. However maintaining this globally envied position is not without cost and if the level of investment falls this position can be easily lost and then perhaps never regained! It requires investment in our specific biosecurity knowledge and skills, in our world class facilities e.g. the Australian Animal Health Laboratory and in maintaining strategies, process and procedures both through Australian Governments and industries. The key role of our unique entities such as Animal Health Australia and Plant Health Australia are critical in maintaining our bio secure status. All of this is a huge strength for Australia and in a future world struggling for food security, an asset than can only grow in value. Are we doing enough to sustain our biosecurity with the ever decreasing investments by all Australian Governments in agriculture and seemingly in rural development? The investment is falling, the global risks are increasing and regrettably it may take a national disease catastrophe before this will change. Is this a risk we want to take?</p>	<p>Martyn Jeggo</p>
<p>What major weaknesses can be addressed for Australia to take advantage of national strengths?</p>	<p>Lack of academic positions There is a huge overproduction of scientists with a PhD in the field of life science. Current post-docs (or research academics) are facing very insecure future due to job shortages and after so many years of education and successful research career due to lack of funds they are left jobless. I think that there should be a way to better plan more sustainable growth in science and provide more job opportunities for future and current PhD holders coming from Australian universities</p>	<p>Nedeljka Rosic</p>
<p>How can we promote effective regional development inc. smart & sustainable settlement patterns?</p>	<p>Developing Northern Australia - sustainably Both Government and Opposition support developing the north - especially in terms of agriculture - but little attention is paid to sustainability - economic and social. Intensive research is needed to establish which crops will grow successfully where (i.e. on different soil types, not just with adequate water), what are social effects (rural communities, land rights of indigenous people) etc. All four of our learned Academies should have key roles in in helping establish trans-disciplinary research into these issues and lobbying Government for dedicated funding.</p>	<p>Andrew Smith</p>