



The productivity agenda

education, skills, training,
science and innovation

Co-chairs:

The Honourable Warwick Smith AM

The Honourable Julia Gillard MP

Lead Facilitator:

Mr Tony Mackay





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OVERVIEW

Members of the Productivity Agenda stream came together in the knowledge that Australia's future depends on educational achievement and on using the talents and hard work of the entire population to create value and solve problems. Participants were asked to consider how we will reach this future and how we might, as a nation, accelerate our progress towards it.

The stream opened with brief comments from Sid Chakrabarti, Catherine Livingstone and Chris Sarra before breaking into four smaller discussion groups aligned with specific policy themes—early childhood and schooling; post-secondary education; workforce and innovation; and science, innovation and digital. During the two days of the summit, the four groups considered the following questions:

- What are our key challenges?
- What are our goals and ambitions?
- What are the main themes?
- What are the big ideas?

After each discussion session groups reported back to plenary sessions and presented their main outcomes for the stream to discuss, challenge and confirm.

AMBITIONS

In considering ambitions for 2020, the stream agreed to the following:

Higher levels of information and globalisation create unprecedented opportunities to increase productivity growth. This growth requires excellent social and physical infrastructure, flexible, fair and equitable labour markets, and a world-leading education and innovation system.

Material resources are finite, but intellectual capital has unlimited application. We therefore need a 2020 strategy to invest more in our capacity for knowledge and imagination and to ensure that we generate sustainable higher returns from that investment in the form of productivity growth. We also need to overcome entrenched disadvantage and ensure that all Australians are equipped to participate in and benefit from these changes.

The group agreed on three goals and ambitions:

- maximising wealth, excellence and equity by driving up productivity to the leading edge of developed countries
- focusing on human capital through early childhood development, world-class education, skills formation and innovation
- encouraging all Australians to realise their potential.

By 2020 Australia will position its citizens at the leading edge of productivity amongst developed countries.

We will know we are on the right track when productivity is maximised by:

- children's development being at the heart of the productivity agenda
- all children achieving individual excellence and having their learning and social needs met



- education, training and work being socially inclusive
- people wanting to, and being able to, move in and out of good jobs, training and education throughout their lives, to suit their family commitments, and their talents and needs
- people being able to gain access to the right learning and work opportunities for them in a diverse economy
- creating an aspiration for continual innovation and learning by Australians
- Australia internationalising its R&D effort and thereby harnessing the best minds, irrespective of geography or national boundaries
- drawing together people and institutions across generations of Australians
- research and development investment from all sources being sustained at more than double current levels (commensurate with the top economies in the OECD), with a commitment to effective transfer of knowledge to help create new jobs, wealth and improved quality of life
- ensuring that policies and programs are informed by evidence and rigorous evaluation
- establishing innovative, fair and productive workplaces.

THEMES

The group agreed that, to achieve the goals outlined above, Australia needs to focus on three priority themes:

- **Equip** all Australians with the capacity to contribute and innovate through an education and training system that leads the world in excellence and inclusion.
- **Deploy** Australia's human capital efficiently and fairly including, by overcoming barriers that lock individuals and communities out of real opportunities.
- **Connect** through collaborations in education, business, research and innovation.

Among other themes raised by the stream were the following:

- Create new connections and collaborations across our education, business and innovation systems.
- Boost the flow of ideas, imagination, people and capital, both within our own economy and internationally.
- Invest more in knowledge, skills, imagination and learning capability.
- Set new standards of excellence and inclusion for participation and learning outcomes.
- Design new forms of institutions through collaboration to provide services and support.
- Build infrastructure that integrates services and encourages shared community use.
- Promote workplaces that value innovation and creativity, are attractive to employees, demonstrate fair workplace practices, and provide fulfilling careers.

Overall, it was agreed that all these activities must reflect a sense of fairness and values.

TOP IDEAS

The stream agreed on the following top ideas, shown here by theme.

IDEAS

Equip

- 1.1 Support kids: overcome the public–private divide in education by, for example, funding students according to need and attracting more private investment.
- 1.2 Extend HELP: extend the Higher Education Loan Programs (HECS-HELP and FEE-HELP) to all students in post-secondary education.
- 1.3 Community corps: allow community service to reduce a person’s HELP debt.
- 1.4 2020 scholarships: deliver merit-based scholarships to vocational education and training and higher education institutions in skills shortage areas.
- 1.5 Thinking Big: accelerate Australian innovation by undertaking ambitious “megaprojects” and establishing associated post-graduate schools in excellence.
- 1.6 Investing in Ideas: commit to a long-term national R&D expenditure that is substantially above the OECD average as a fraction of GDP.
- 1.7 Science and maths connections: inspire student enthusiasm and improve science and maths education by connecting scientists and others with teachers, especially in our primary schools.
- 1.8 Reward excellence in teaching: focus on the connections between quality teaching and productivity.
- 1.9 Celebrate teaching: celebrate the vocation and contribution of teaching.
- 1.10 Teaching first: establish a national program to attract talented graduates and career-switchers into teaching, and reward teachers for working in national priority areas, including in disadvantaged communities, in remote areas and in subjects with teacher shortages.
- 1.11 Better evidence: education policies should be guided by the principle of ‘what works?’, and underpinned by rigorous and scientific evaluations.
- 1.12 Innovation Australia: establish a coherent National Innovation Agenda to drive Federal and State government policies on innovation and creativity.

Deploy

- 1.13 Windows on workplaces: encourage employers to provide good jobs in safe, healthy and productive workplaces, and empower employees to choose their preferred workplaces by facilitating the dissemination of information about employment experience—for example, work–life balance and family-friendliness.
- 1.14 Skills development: employers to take responsibility for developing the skills of their workforce and helping their staff realise the full potential of the digital economy. In return, they are able to have access to a flexible, demand-driven training system.
- 1.15 Work in the bush: provide incentives for people to work in rural and regional Australia by supporting people who relocate from areas where there are few jobs available to areas where there are labour shortages.



- 1.16 A mobile labour market: enable the free movement of labour from the Asia–Pacific region into Australia, underpinned by Australian workplace standards.
- 1.17 Learning for life account: Develop lifetime participation accounts for every Australian into which the government and others can make payments for education, training, parental leave, and superannuation contributions. The accounts would have the capacity to go into deficit with repayment being income-contingent and would therefore open up opportunity for individuals to access eligible services, particularly early childhood and learning services.

Connect

- 1.18 Parent and children centres: communities have access to integrated services to support children’s health, development, learning and care. Childhood development should be supported through a place-based culture that offers integrated services and community support.
- 1.19 Life learning centres: service centres help working-age Australians meet their family and career needs.
- 1.20 Releasing latent value in our human capital:
 - 1.20.1 one curriculum, more money for schools: creating a national curriculum and rationalising curriculum development bodies, with freed-up funds going to children in schools
 - 1.20.2 business–school connections: creating a coordinated partnership program between Australia’s top 200 public and private organisations and our schools. This programme could also include universities, research agencies and vocational education and training institutions
 - 1.20.3 Golden Gurus: retired people acting as mentors in all aspects of economic and social life
 - 1.20.4 science, business and arts into schools: connecting scientists, business and the arts with the education system, with the use of specific engagement criteria as a condition of public funding
 - 1.20.5 One Australia: mobilising the intellectual resources of the international diaspora network of Australian expatriates and former foreign students.
- 1.21 Connecting Australia: using new technologies to foster new working environments that dissipate the “tyranny of distance” both within and beyond Australia
- 1.22 A business–research connect: removing barriers to the flow of knowledge generated within the research sector by fostering open approaches to access and dissemination

RECORD OF DISCUSSION

The Productivity Agenda stream focused on education, skills, training, science and innovation. Discussion was centred on how to maximise human capital.

A common theme was that in the future, productivity will be about innovation and education. From a longer term perspective, it will have been about what we do now to improve early learning and schooling. Co-Chair Deputy Prime Minister Julia Gillard, referred to a recent meeting of the education ministerial council in which Rod Welford, the Queensland Minister, summarised the goals of productivity and

education under the concept of 4 “Cs”: competence - in the essential domains of life; creativity; character - social and interpersonal; and citizenship - for active participation in the neighbourhood and nation.

A Youth Summit representative Sid Chakrabarti reported on the ideas identified by representatives of Australia’s young people. One top idea was paid parental leave for 14 weeks and return-to-work schemes following parental leave. Other ideas concerned addressing the quality and retention of school teachers, setting literacy improvement targets for under-15-year-olds, and lifting teacher and student performance. On the question of teacher remuneration, the Youth Summit recommended increased pay according to teaching’s relative contribution to productivity growth in Australia compared with the contribution of other professions. Also put forward was the idea of varying pay levels, with 80 per cent based on aptitude and 20 per cent on performance.

Catherine Livingstone stressed the importance of innovation, saying that people, not institutions, innovate. Intellectual capital is therefore essential. She argued that concepts of efficiency and effectiveness are no longer as relevant and that, instead, capability and incentive are key concepts to foster innovation and provide the culture and freedom to work in creative, new ways. She also noted that innovation relies on implementation capability through applying ideas, persistence and greater tolerance of risk.

Chris Sarra challenged the group to move away from a deficit mindset when it comes to educating Aboriginal and Torres Strait Islander children. He argued that Aboriginal and Torres Strait Islander children should remain in their communities and be able to achieve as much as any other child: every child should aspire to excellence. He made a number of further observations:

- Cultural difference forms part of the pursuit of excellence; it is not a replacement for excellence.
- In education terms, Australia is a high-quality, low-equity country by international standards, so we need to raise the performance of children facing disadvantage.
- The way forward is to acknowledge and embrace Indigenous agencies.
- We need to re-instil a sense of integrity and honour in teaching and learning so that we become a stronger, smarter country.

Ambitions

Members of the stream acknowledged education’s central role in human capital development as the main driver of future economic growth for Australia and as the base for strong communities. The following was agreed:

- Universal access to high-quality education for early childhood development is an essential starting point. All Australians need to be equipped from birth throughout life by providing a world-class system for care, learning and schooling.
- We need to prepare our young people to be flexible workers as they will change occupations many times throughout their lives and will increasingly operate as part of global production and knowledge systems. A true education revolution is needed if Australia is to stand in the world as the smart economy.
- A substantial lift in research and development effort and a commitment to innovation will be the basis for Australia’s future. One thing that is most certain is uncertainty. We cannot predict how we will operate in the world in 2020, but we do need to have a strong base in research and development and robust, high-speed communications.



- Our higher education and training systems need to become more flexible to meet students' needs. They must be structured and funded to encourage Australians into and out of training and work that aligns with their career aspirations and caring responsibilities. A commitment to lifelong learning for all Australians was also seen as a prerequisite for maintaining Australia's competitive advantage among nations. This should be underpinned by paid parenting leave.
- Our institutional arrangements need to be reformed. Policy and funding should be driven by the needs of the individual rather than the institution. More focus should be given to providing the right incentives for businesses and individuals to pursue economic and societal outcomes. To this end, government purchasing and funding needs to be reformed to give scope to our institutions to be innovative to achieve the required outcomes. Government policies should be "road-tested" with citizens before they are fully implemented to ensure that new schemes and arrangements can stand the test of time.
- Australia also needs to be regarded as a good place to work and live. Productive, safe industries are the generators of Australia's wealth. There needs to be new partnerships between businesses and employees to help generate new levels of productivity. Workplaces need to be transparent, so that employees can enter into work arrangements that suit their needs and can optimise their contribution to work. Small businesses (including self-employment) represent a large component of Australia's enterprises, and they need to be factored into the productivity agenda.

Early childhood and schooling: ambitions

The group's ambition was that by 2020, children's early development will be at heart of the productivity agenda. The group aspired that all children will be school ready and that they will enter world-class schools that meet their educational needs. It was agreed that we need to reach the situation where:

- all communities support the development of children
- parents and professionals who work to develop children are highly valued; and
- service structures are based on research and evidence.

For our youth, the group hoped that they, along with teachers, parents and the community, will have high expectations for achievement. Assistance would be given to those students who may be falling behind to help them achieve to the same level as other students. It was agreed that the highest priority would be to ensure that disadvantaged students, including those from Indigenous and low Socio Economic Status groups, have the opportunity to achieve the highest level of education outcomes. For example, all Indigenous students who wish to, should be ready to enter university.

Post-secondary education: ambitions

The group identified as an overall ambition that by 2020, every Australian resident will have the opportunity to be skilled and educated at many points in their life, to meet their own wants and needs and to meet the needs of the workforce. It was hoped that those currently marginalised in the education sector would be able to access and succeed to the same level as the broader Australian population. Employers and the industry sector would be active participants in the formal education system and would contribute along with individuals, government and non-government sectors.

Participants discussed ways to achieve these ambitions, and agreed that:

- The education system needs to operate seamlessly through schools, vocational education and training and higher education, which is not the case at present.

- To bring about change it will be important to reprioritise skilling strategies, learning pathways and funding to aim by 2020 for an 80% workforce participation rate and universal post-secondary education.
 - For this to be achieved it will be imperative that individuals take responsibility for their learning and that industry take responsibility for the skills formation of their workforces.
- We need to encourage all people to pursue post-secondary education as part of their life course, especially those from disadvantaged backgrounds such as low socio-economic status and Indigenous communities. The aim is for universal post-secondary education which recognises that human capital formation is not a linear process, but one where people enter and exit numerous occasions over their life course.
 - This will be assisted by creating better institutional linkages and empowering people to manage their lifelong learning as they move between work and study.
- Students must be empowered to make choices supported by a harmonised and integrated post-secondary system that doesn't lock students into one stream of education and training.
 - Currently there are some disincentives to articulation and accreditation across education sectors.
 - To solve this problem greater integration of policies across different levels of government will be required.
 - Further, there needs to be collaboration between industry and the professions; and it needs a local, national and global focus. This can't be held back by the vagaries of the state-national divide.
- We need to develop a world class university system by 2020. To do this we need to move towards educational funding systems that are flexible, without central bureaucracies dictating plans. We need to acknowledge that every tertiary institution is equally valuable in order to ensure that all students appropriately transition between sectors and into work.
- We also need to encourage partnerships between education and research and innovation. Importantly we need to develop education systems which can respond to issues which have not been predicted:
 - "We have to educate for what we can't imagine" – *Bill Gates*.
 - A lot of things have happened over the last twelve years that we couldn't have predicted. We don't know what the future will look like but we do know that people will make multiple transitions – the old linear model won't work. We therefore need to set up systems that capture 'unpredictability'.
- We should also aim for the first Indigenous Vice Chancellor of a mainstream university in Australia by 2020.
- In addition, we need better recognition of trade qualifications. The value of high quality craftspeople needs greater recognition in society and trades need to be afforded greater status as an occupation, especially in view of the commitment to training required of apprentices.
- To integrate work and learning we also need better engagement between workplaces and work-based learning, to balance theory and experience. We need to find ways to entice industry to allow students to work for a limited period of time or part-time.



Workforce and innovation: ambitions

The group's discussions were broadly aimed at redressing Australia's skill shortages. Two key ambitions were identified:

- to increase the labour force supply
- to increase the productivity of the workforce.

The ambition was of an Australia that by 2020 has a workforce where anyone who wishes to participate can do so and all direct and indirect barriers to participation are removed. The workplace, the education system and the broader community will be well connected and would understand and meet each other's needs. Australia will have a dynamic and adaptive workforce that reflects Australia's and the world's needs. Workforce participation will be flexible and adaptive to needs, with people able to work from home or wherever they choose. By 2020 life-long learning would be the norm, and employees can move freely between work, education and training courses and creativity is valued, encouraged and supported by employers and government.

Other ambitions identified related to increasing the labour force supply, increasing the productivity of the labour force, improving outcomes for those in work, and the role of education and training.

Increasing the labour force supply

- Support disadvantaged people into education and training, provide incentives for participating (and disincentives for not participating) and remove barriers to participation such as reducing the marginal tax rate of those moving from welfare to work.
- Increase IT literacy.
- Provide to the education and training system information about the needs of industry and the community, so that education and training can better equip people to meet the demands of the workplace.
- Improve the quality of education and training outcomes of improve the portability of workers across the economy.
- Change work structures and support to make it easier for people to return to the workforce—from parenthood, education or other life circumstances.
- Import labour from other regions in Australia and from overseas.
- Build the workforce and infrastructure in regions and remote Australia to support Australia's economic development.

Increasing the productivity of the labour force

- Improve the quality of training so that workers can lift their productive capacity and build a career.
- Ensure that skills training matches the needs of industry.
- Ensure that training is relevant to the needs of industry through good information and connections between education sectors, industry and the community.
- Provide career advice to those changing careers or moving in and out of the workforce, to make it easier to switch careers and develop new skills.
- Recognise and promote that good conditions for workers result in higher productivity.

- Make conditions offered by employers more transparent and improve employers' accountability against the conditions they offer.
- Ensure that funding mechanisms support increased availability of education and training and increase their quality and relevance to the workplace. Key mechanisms to achieve this could be collaboration and partnerships.
- Establish workforce accounts and work–life centres to promote life-long learning and to support moves into and out of the workforce.
- Support small businesses in their training needs by enabling mentoring and training support from retired and semi-retired people.
- Acknowledge the productivity gains that could be achieved through mechanisms such as flexibility in hours, location of work and assisting successful professional career change.
- Apply creativity in workplace arrangements to suit industry and employee needs—for example, to support fly-in fly-out arrangements in remote locations, arrangements could include four months on and two months off.
- Provide support for parents through paid maternity leave, paternity leave and supported return to the workplace.

Improving outcomes for those in work

- Increased workforce participation should not be at any cost but should take account of the personal circumstances of individuals.
- Regulate the labour market to provide job security and a voice for employees. Collective bargaining might be an answer.
- Improve the built and IT aspects of the workplace environment to improve amenity for all workers and access for the disadvantaged.
- Focus on continually improving the quality of working life, bringing innovation to the workplace and improving work practices.
- Develop measures to improve work-life balance, the family friendliness of workplaces, addressing issues of career flexibility (including enhancing people's ability to transition from one credentialled profession to another) and supporting people to move in and out of the workforce to improve income security.

Preparing for the workforce through education and training

- By 2020 provide free, high-quality, universal pre-school for kids, to support labour market participation for women.
- By 2020 all schools will run a career readiness program that helps students understand their transition options, rights at work and responsibilities.
- Provide infrastructure and career paths for rural kid young people, so they can see a reason and a way to stay in rural and regional communities to meet the skill needs of industry.
- Make education far more strongly directed by the needs of industry. By 2020 no one should graduate from post-secondary education unless their qualification is made up of at least 20 per cent



workforce experience. Schools or post-school institutions should have at least 30 per cent employer representation on their boards.

- Develop the best career advice system in the world.

Science, innovation and digital: ambitions

In connection with science, innovation and digital, the group focused discussion on how to increase the contribution of the whole innovation chain to lifting productivity. In particular, Australia should aim to be a leader in R&D, social networking, infrastructure to support innovation, and skills that contribute to the Australian economy, whether based here or abroad.

The group expressed concern that Australia was declining relative to other economies in a number of key measures, from expenditure on R&D to the deployment of new ideas and technology.

The importance of facilitating collaboration was stressed: we need to harness the skills of all Australians, no matter where they live, and to achieve this we will need appropriate communications infrastructure and a greater willingness from institutions to collaborate.

Social networking

- Create a framework to allow the private sector to invest. Broadband of 100 megabytes per second was suggested as a target, but there was also concern that, given potential technological improvements in the next 12 years, what seems a laudable target now might seem risible by 2020. A national broadband resource is needed.
- Empower the elderly by facilitating their access to the digital economy and digital resources.
- Ensure that access to broadband is affordable.
- Distinguish between platform ambitions and other ambitions (need the broadband to make it work - it is an enabler).

Mobility

- Embrace mobility: encourage university students to spend a semester at an overseas university.
- Establish mobility as a core competence of the workforce.
- Internationalise the entire innovation system: open up the Australian Research Council, universities and companies to face international competition.
- Establish a national register of our diaspora to encourage their continued engagement with Australian society.

Human capital

- Encourage business to support PhDs and the government to set up PhD centres of excellence.
- Encourage expatriate Australians in mid-career overseas to return to Australia through preferential tax treatment of retirement savings. The current arrangements make it hard for Australia to compete for talent. We need to encourage brain 'circulation'.
- Free our leading scientists of the time they need to spend on grant applications—currently up to 70 per cent of their time. This alone could potentially triple their output.

- Develop connections between schools and universities to excite and engage students and teachers.
- Develop a better understanding of the roles of government, academia and business in an innovation system.
- Intellectual Property laws to keep pace with technology to ensure that information can be shared without infringing the rights of others.
- Establish arrangements to increase the number and quality of science communicators.
- Apply a broader definition of 'science' based on knowledge of the world, including the humanities. There is even a role for poetry.

Innovation

- Assist Australian industry to better capture the benefits of R&D.
- Double the resource commitment to innovation outside the R&D sector: 65 per cent of innovation in Australia takes place outside R&D channels.
- Reduce the 'price' of funding for public research i.e. high overhead costs on scientists in managing application processes and other paperwork for public research is unnecessarily lifting the price of innovation for governments.
- Reduce the cost of access to innovation information. At present, high costs reduce the demand for science and research from institutions and can discourage business from seeking out and adopting the findings of research. Costs, risks and pay-offs in this area could be shared between governments, business and the research community.
- Establish prizes for areas in which the government wants people to be innovative.
- Encourage both private and public investment in research.

Themes

Early childhood and schooling

A central theme identified for early childhood and schooling was that early childhood development should be at the centre of policy and programs. Participants further noted the following:

- Institutional forms need to support early childhood development and social inclusion. We need to create healthy communities that support children, and we need a change of mind-set to achieve a more child-centric model of care and learning. The work of Jacques Delors on the four pillars of education—knowing, doing, being, and living together—provides a sound basis for some new thinking.
- Given that much development, even educational development, happens before children start school, the notion of nurturing of learning from birth should be supported by a stronger focus on early childhood care, development and education.
- We must ensure that *all* children are provided with high-quality early childhood and schooling experiences. We need to have high aspirations and expectations that all students will achieve to their potential and that no child will be allowed to fall behind. Evidence points to Australia not doing enough to overcome the disadvantage caused by low socio-economic status. Some argue that the fragmentation of schooling arising from funding policies inhibits social inclusion and exacerbates



social divides. Rather, funding and service delivery should focus on need and should support a more integrated approach, recognising that learning can happen at school, at home and in industry.

- Education and learning should support all Australians in their efforts to achieve to their potential. We need to have high aspirations for all children. Of crucial importance to this is the need for a stronger evidence base and for trialling and assessing what works.
- Education must foster creativity, since this is one of the greatest contributors to productivity in the 21st century.

Post-secondary education

Participants agreed that, to improve the nation's productivity, we must have an efficient labour market, an outstanding education system, effective infrastructure, and an appropriate competition framework. In addition, the following was noted:

- The skills shortages that Australia is facing are creating a crisis in terms of the nation's future productivity. These shortages are largely the result of a deficit in the development of vocational and technical skills, rather than higher level university qualifications. If we are to tackle the shortages effectively, however, we need to take a broad, integrated approach rather than try to deal with specific areas in isolation.
- In order to meet skills requirements we need greater capacity for the nation as a whole to anticipate and identify what skills we will need in the future and plan for these as much as possible. This should not be approached simply from a 'supply-side' point of view but should be supported by a system that provides adequate funding to ensure that we are getting the right skills for the nation.
- We need to move on from the old paradigm of public versus private education—in both the vocational education and training and the higher education sectors—that says one is good and the other is bad. People should have the right to choose where they study. We must accept that there are many ways we can educate people in Australia, and they should all be valued.
- There needs to be recognition of workplaces as sites of innovation and the application of knowledge and that industry drives innovation.
- There should be a stronger role for enterprises in the education of the nation's workforce. There need to be more partnerships between the industry and business sectors and the education sector. Employers and educational institutions need to be able to change and adapt quickly.

Participants also raised a number of themes relating to post-secondary education:

- Collaboration is not happening efficiently across sectors (between vocational education and training and higher education) and across education and work.
- There is a need for national consistency in schools. A good example of this consistency is national training packages, which are working well in vocational education and training.
- The number of international students in vocational education and training is increasing, but these people are not staying in the industry after they receive their residency. International students could be required to stay in the industry for a set duration to gain on-the-job skills, similar to apprentice arrangements. This could help resolve the workforce shortage problem.
- Education policy should factor in the broader benefits to society from schooling and post-schooling education otherwise there is a danger that short-term planning and funding for immediate needs will compromise the realisation of these benefits

- To overcome the problem of an ageing teaching population, young people should be encouraged to become teachers and educators.
- Long-term planning for education and training is required in order to meet Australia's future workforce needs.
- University lecturers need to get out in the workforce and industry experts should connect more with universities to foster greater interaction between the two sectors.
- 'Work–life' balance should be replaced with 'work–life–learning' balance.

Workforce and innovation

Participants noted that in order to increase the labour force supply, it is essential to ensure that those who are not in the workforce have the means of gaining access to it. It was argued that the disadvantaged and excluded in the population must be offered the necessary education, training and incentives to enter the workforce. Further, the following was agreed:

- Removing barriers to participation is crucial. These may be barriers such as the taxation system, which can create a welfare trap that makes moving from welfare hard. Work structures and support also need to be addressed, to make it easier for people to return to the workforce from parenthood, education or other life circumstances.
- The links between the education and training system, industry and the community need to be strengthened. Collaborative partnerships between industry and our education and training systems need to be encouraged and fostered. This will ensure that our education and training system can better equip people to meet the demands of the workplace.
- Collaboration must be two-way: business needs to help the education system. This might be through providing mentoring services or more direct support and input into education or training courses. These collaborative links can help ensure life-long training is available to all.
- Workforce flexibility needs to be encouraged and supported. This should include measures such as ensuring the portability of education and training qualifications, providing improved careers advice, and national access to high-speed broadband that enables people to work wherever they are.

Other themes were also put forward:

- Ensure that due consideration is given to the impact of workforce flexibility on employers.
- Recognise the potential for significant waste of public funds if measures sufficiently are not sufficiently targeted—a dead-weight loss. For example, measures to increase access should specifically target the disadvantaged or they will be ineffective and wasteful of resources.
- Develop initiatives that link health, workplace, and education and training initiatives. We will not resolve significant disadvantage without looking across 'silos' of service responses. There are 2.2 million males out of the workforce because of health, rehabilitation and illness problems. We must look at the whole welfare safety net.
- Improve participation as a way of improving productivity.
- Provide researchers with access to the principal databases for major social policy areas (within privacy protections). At present health, welfare, tax, and education records are inaccessible because they are held by governments. As an example, it is impossible to compare rates of cancer in the city against those in rural areas.



- Encourage a mind-shift in Australia to recognise our own competence and excellence on the world stage. We should establish a corporate and work culture that stands for excellence.

Science, innovation and digital

- Australia needs a national innovation agenda (R&D, deployment, and so on) that seeks to lift our efforts across all parts of innovation.
- We need to be, and be seen to be, a country that innovates collaboratively.
- We are behind our OECD competitors in the number of PhDs relative to our population and number of graduates.
- There has been a significant decline in the number of trainee teachers wanting to become mathematics teachers. The shortage of competent and engaging mathematics teachers reduces Australia's capacity to undertake research requiring mathematics capacity.
- The funding system needs to be balanced for a broader range of innovation—away from the current bias toward physical science.

Challenges

Early childhood and schooling

To achieve a vision for Australia as the best educated, best skilled, best workforce in the world there are many challenges. Participants discussing this policy area considered the following questions:

- How do we get there without leaving some people behind—especially Indigenous Australians and children from low socio-economic status households?
- How do we improve the connectivity between schools, universities and business and between schools, parents and communities and integrate service provision and funding to support this?

It was agreed that we need to look from the perspective of individuals not from institutions, so we need to talk about a framework to meet early childhood and schooling needs. A key challenge was seen as achieving higher productivity by ensuring everybody has an opportunity to achieve. Early childhood intervention was seen as the first step in this process.

Participants also noted that if the goal is for inclusive education that strives to achieve individual excellence for the common good we need to consider whether current social policy and institutional arrangements help or hinder.

Finally, it was agreed that to do better we need to know what works in helping Australian students achieve top-rate educational outcomes. Australia should adopt a 'gold standard for evaluation' in education.

Post-secondary education

Participants agreed on the following:

- A major barrier to increasing participation in post-school education and thereby to lifting outcomes from this sector is high financial costs. Income-contingent loans are an important source of funding for students and are not spread widely enough across all aspects of post-compulsory education.

- Our workforce participation rate needs to be increased in order that we can continue to maintain our international economic competitiveness. Australia should commit to an 80 per cent workforce participation target.
- Businesses and employers need to play a central role in skills development. Employers are in the best position to take responsibility for skill solutions. They know the skills needs of their workforce, and they can provide incentives for their workers to take up training and further education. At present there is a mismatch between education and business. Business and educators need an accord at the local level across the country to identify skills needed to take a region forward. In this way businesses are formal partners with educators in the regions. This could possibly be a legislated arrangement. We need to prioritise—at possibly the state and territory level—to bring together all levels of business and education to nurture potential and competitive advantage. An example of responsiveness to industry is the Curriculum Centre in New South Wales TAFE, which has an industry advisory board that comments on the curriculum.

Other challenges were also identified:

- It is essential to overcome ineffective Commonwealth–state relations. We need to dismantle governance structures around education: they are currently undermining our efforts. State boundaries and institutional boundaries create much wastage. We therefore need to seriously re-examine the governance systems around education at all levels.
- There should be a stronger focus on workforce planning. There is a lack of analysis that links labour market, population and education.
- Preparation for future work practices is crucial. We will all need to be global (and bilingual) employees in 2020. Language training has fallen into desuetude, and we are not preparing for cultural challenges ahead, at either school or post-secondary level. We should be changing the syllabus in all areas of education to take this into consideration.
- Improve planning and increase funding for strategic skills. Industry knows what is required, but is not connected with education planning. For example, planning has not addressed the current lack of scientists and engineers.
- Encourage long-term planning: we have lost sight of the strategic skills that will take our country forward. For example, the resource industry is suffering from a lack of engineers and we don't have enough people in university to meet these needs.
- Create a statutory authority to monitor the health of all education sectors and the match with workforce development needs, which policy makers can then use in planning. The Australian Institute of Health and Welfare is a good model. Some participants raised doubt about this approach because many future graduates will be working in careers that we cannot imagine at this point.
- Take innovative approaches to training and education. For example, Maastricht University is renowned for its problem-based learning method as an innovative way of teaching. One-third of its students and a quarter of its academic staff come from outside The Netherlands. The majority of its educational programmes are taught in English. And most of the education and research has an international orientation.
- Rethink funding structures to encourage flexibility. The way TAFE colleges are funded reduces their ability to be flexible. The central bureaucracy locks in university funding and funds the same number of students year after year. Dual-sector institutions working across vocational education and training and higher education are locked into two different sorts of funding because they are dealing with two levels of government. There is no planning or discussion with each other or with industry.



- Build the capacity of the education workforce. High-quality teachers are essential for the best outcomes for students. We need to ensure that teachers develop core competencies in creative thinking, communication skills and ICT skills and can push the boundaries of professional teaching practices. Pay levels should be matched to performance—possibly through a scaling system of pay, a star-rating system
- Refresh the apprenticeship system. A significant proportion of apprentices do not complete their training, and of those who do, many leave the trade within five years. Other approaches to training for the trades could be developed.
- Provide more public information on vocational education and training and higher education, so that people understand what they are going to do in a course and what they will get out of it. We need better information and to be more informative, so that people are able to choose the right course for them and plan their career better. Students often choose the wrong course and then withdraw. Of a number of teenagers canvassed before the summit, most did not know where they wanted to go, even though they were at the point of entering their final year of school.

Workforce and innovation

Access

- Local populations need to be employed before people are flown in to fill the jobs. This means giving local unemployed populations incentives to enter the workforce, and disincentives to stay out of the workforce. This is about getting people to a work ready state. This should be directed solely to all disadvantaged groups in regional Australia.
- Improved access for the Aboriginal community is essential. It is not a matter of removing obstacles: it is about increasing investment. There is no investment in the geographic areas in which Aboriginal people live. The problem is exacerbated by the dual economy that operates in mining areas, where companies import labour even though there are unemployed Indigenous Australians nearby. Employers' policies can have a significant impact.
- The way we define jobs and work is rapidly evolving. The capability debate will become increasingly critical as technology, especially ICT, becomes more embedded in workplaces. Those who are not IT literate will be disenfranchised in the future.
- The way we define jobs and work is rapidly evolving. As technology becomes more embedded in workplaces, particularly information technology, the capability debate is crucial. Those who are not IT literate will be disenfranchised in the future.
- Fix the effective marginal tax rate for those moving from welfare to work. Currently there are massive tax disincentives for this group. We could initiate an inquiry into the overlap of work, tax and welfare. The income support system could be simplified. There should be a uniform base, with add-ons for special needs. Disincentives to progress to real jobs should be removed.

Those in the work force

- The labour market is not well supplied with information. Workers seeking to work for a company will be told many things about the benefits of working there, but companies are not accountable for this information. Employment marketing information from companies should be standardised and published so it can be compared by potential employees. A standard for this information should be introduced to redress this market failure. Such a standard would be a public good. Companies could measure themselves against the standard through a voluntary program. These measures (such as

family-friendly measures) have been found to be highly predictive of long-term corporate performance and so could inform the capital market as well. This would drive productivity in capital, improve management, and improve employee satisfaction. The standard could include reporting on the inclusiveness of corporate culture and the level of representation of women in senior management.

- In the old environment people could do an element of training at entry and then the job would progress throughout their lifetime. Now there are discontinuous employment patterns—breaks and changes in direction. People change jobs, change careers and employers change functions and jobs. Education and training needs to accommodate this job mobility.

Regional development

- Governments advocate the development of remote and regional areas, but it is difficult to attract people with the necessary skills into these areas. There is a big opportunity for Australia to increase its productivity by providing the platforms for development in remote and regional areas, without putting the burden solely on the employers.
- A number of different entities are being resourced to provide education and training, but they are competing for limited funds. The government should be funding collaboration and partnerships that deliver the services to get people into the workforce. This could resolve the problem of educational silos across schools, vocational education and training institutions, universities and workplaces. Funding should encourage collaboration through industry or regional communities. There needs to be more planning and integration across the education and training streams.

Providers of education and training

- Training in some regional areas and sectors of the economy could be more efficient. There is some concern, for example, that some Aboriginal people in North-West of WA have numerous certificates but they are not valued by employers. Government planning and funding for training could be more effective. In addition, the range and number of training providers in Australia places particular priority on ensuring that all are delivering training to a high quality and that they are offering training that meets the career and educational aspirations of their students.
- One body should take ownership of coordinating and supporting school to further education, to work pathways. It currently falls between the Commonwealth and the states and territories, resulting in poor outcomes for people and dissipation of good initiatives.

Science, innovation and digital

- There is a need to better understand the activities that drive the two-thirds of innovation that is not directly driven by research and development.
- The average OECD spend on research and development is 3 per cent of GDP. Australia should spend 3.6 per cent of GDP on R&D to catch up—1.6 per cent from direct government expenditure and up to 2 per cent from dollar-for-dollar matching (1 per cent from government and 1 per cent from the private sector).
- After we catch up with the OECD average we should maintain expenditure at 3.6 per cent to ensure that we remain among the top nations for innovation.
- We should re-examine our school curriculum to look at how we teach patterns of thinking.
- Private sector research and development dropped over by 24 per cent in the 10 years to 2006. It should be an aim to double R&D by 2020.



- There is a big gap between what we know and what we use. We need to open up the knowledge pool residing in universities. Business must demand the knowledge held in universities; universities cannot push the knowledge onto business. Increase the amount of collaboration between the public and private sectors.
- The cost of gaining access to research originating in universities and public sector research institutions is a disincentive for business to take up the latest research findings. We should aim to reduce the price for access to government-funded research.
- Research and development must be internationalised. We should develop mechanisms to connect the best minds.
- The importance of basic research in a national innovation system must be recognised.
- Australia must be seen as the country that innovates collaboratively—Team Australia.
- The image of Australia’s intellectual capacity could be better marketed internationally.

Ideas

The following ideas were discussed in plenary sessions and identified as the big ideas for the stream.

IDEAS

- 1.23 Encourage more private investment into key productivity-generating areas, especially through better design of markets.
- 1.24 Universal access principles for people with disabilities should pervade all social policy planning.
- 1.25 Adults should talk to children about success—top 100 companies to connect with schools—through mentor and work experience arrangements.
- 1.26 Develop a comprehensive definition of ‘productivity’.
- 1.27 Introduce a national, paid maternity leave scheme to operate alongside expanded access to early childhood care as a whole package to promote workforce participation.
- 1.28 Test and trial new ideas for education—similar to the clinical trials adopted for disease. This would be founded on a science-based commitment to find out what works. Australia would also need to establish a gold standard for evaluation of public policy initiatives.
- 1.29 Encourage connectivity between schools, universities and business. Research should be connected to schools and business.
- 1.30 By 2020 every Australian should be in a position to believe that every child has the same capacity and talent to lead a fulfilling life.
- 1.31 Require that there be a ‘children’s development impact statement’ for every policy and initiative.
- 1.32 By 2020 we should be regarded as one of the world-leading countries in education.

Many other ideas were also raised, as follows:

IDEAS

Early childhood and schooling

- 1.33 Childhood development should be supported through a place-based culture that offers integrated services and community support.
- 1.34 Every child should be given an early development assessment, including for disability and disadvantage. This could be funded through Medicare and delivered by early childhood centres.
- 1.35 Overcome the public–private divide by funding students according to need and encouraging more private investment in public and private schools through
 - 1.35.1 student-centred funding
 - 1.35.2 funding according to need, where disadvantaged students attract more funding and support to ensure that they become a productive participant in Australian society
 - 1.35.3 further cross-sector collaboration
 - 1.35.4 integrated sources of funding attached to students and/or institutions. One option would be to rationalise the use of private investment and then use public investment to make up the shortfall. Private involvement is not necessarily for profit but for broader economic return.
- 1.36 Build infrastructure that integrates a wider range of services and encourages shared community use. Schools could be the focal points for social capital.
- 1.37 Until actual hubs are established, develop stronger links between early childcare centres. Recognise that bilingual education is very important in Indigenous communities.
- 1.38 As a cost-saving big idea, rationalise the curriculum and assessment process by supporting a national system and use savings from current duplication of curriculum development for further investment in education—especially in early childhood education and school.
- 1.39 Consider system-wide improvements—for example, paid maternity leave.
- 1.40 Using research results from six countries about how schools dramatically improved in disadvantaged settings, examine and apply the critical success factors—building intellectual capital, social capital, spiritual capital and values, and financial capital.
- 1.41 Build formal partnerships between industry, business and schools—for example, mentoring for success by top 100 companies.
- 1.42 Do not let go of the 30 per cent of students who fall behind. One-on-one support and special education are required for these students.
- 1.43 Have high-quality teachers go to remote schools for a term to mentor groups of less-experienced teachers.
- 1.44 Realign investment to support children’s development by more investment in early intervention and childhood education.



Post-secondary education

- 1.45 Extend the partnerships between 100 top companies and schools to include universities and vocational education and training institutions.
- 1.46 Extend the Higher Education Loan Program (HECS-HELP and FEE-HELP) to all students in post-secondary education.
- 1.47 Establish a productivity levy to include incentives to business in return for partnerships in education, and business to institute a 'skills pledge', recommitting to skilling their workforce.
- 1.48 Establish an independent national agency to collect and publish trends in education and the workforce across the sectors.
- 1.49 Education policies should be guided by the principle of 'what works?' and underpinned by rigorous scientific evaluation.
- 1.50 Include universities and vocational education and training providers as partners with schools, in line with the Deputy Prime Minister's idea for partnerships between the top 100 companies and schools.
- 1.51 Introduce a new form of government funding targeted at the local level and contingent on collaborative relationships—in the form of a 'compact' or memorandum of understanding.
- 1.52 Expand ABSTUDY to all post-secondary Indigenous students to facilitate engagement with education and ultimately the workforce.
- 1.53 Remove rigidities in funding arrangements
- 1.54 Restructure incentive arrangements for apprenticeship training as the lever to overcome skills and labour market shortages.
- 1.55 Introduce 500 'Mabo scholarships' for Indigenous students in research and higher level degrees similar to the Endeavour scholarships.

Workforce and innovation

Those in the work force

- 1.56 The Golden Guru is a plan that would use the untapped skills of senior citizens. This core of senior citizens will contribute their spare time to whoever needs it in for small and medium businesses that cannot afford training:
 - 1.56.1 The scheme would be voluntary, with no joining fees.
 - 1.56.2 Trainers would be paid \$150 for a day of training, with costs borne by the employer.
 - 1.56.3 Golden Gurus would provide training and support in three streams—trades, professional, and middle management.
 - 1.56.4 A database would be deployed to enable matching of the needs of participating businesses with the available trainers.
 - 1.56.5 Developing countries could be invited access Australia's Golden Gurus.

- 1.57 By 2020 we should have a workforce where anyone in work can participate to a level they want:
- 1.57.1 All barriers are removed.
 - 1.57.2 The workplace and all education outlets connect with the community.
 - 1.57.3 We have a truly dynamic workforce, reflecting the requirements of the world.
 - 1.57.4 Workforce participation is interactive, and people can work from home or wherever they choose and move in and out of the workforce.
 - 1.57.5 Creativity is supported.
- 1.58 Develop a cure for type 1 diabetes using stem cell technology. It was noted that diabetes affects about 5 per cent of Australians, of whom about 150 000 are young people. Diabetes is an area of research where success is highly likely by 2020, and the rewards would be significant in terms of health outcomes and export potential. Venture capital should find this research very attractive. It was argued that the government needs to provide the research support infrastructure in order to attract the venture capital and researchers to the project. Participants thought that failure to invest will see overseas competitors develop the science, technology and patents, resulting in Australia importing this later at higher cost.

Life-long learning and working

- 1.59 Working people's hubs would use existing resources more effectively to provide community-based centres for people of working age. The hubs would provide advice on employment, training, career management, health and housing services. This would be through provision of information, support, case management and income support. It would be available to all aged from 16 to 76 years and would in particular support those marginalised from the workforce—such as the 2.2 million men with health problems impeding their access to work, carers, and women returning to work and education. It would assist in providing individualised responses for these citizens, whose needs do not match the current education, training and work structure.
- 1.60 At birth or on gaining citizenship each Australian has a workplace account opened. Contributions could be made by the individual, government and /or employees, and the funds could be spent on childcare, education, career breaks and mental agility support for older Australians. The account could be overdrawn and would exist throughout the person's life.
- 1.61 Support life-long learning to assist in career management, helping address the digital divide and rapid changes in the workplace and preventing further marginalisation of people.

Regional development

- 1.62 People to flow across borders as freely as money. With more movement will come more knowledge of our neighbours and less fear. This would be done while supporting Australia's minimum standards in the workplace.
- 1.63 Improve the skills of local people, particularly Aboriginal people, before importing labour.
- 1.64 Develop links with Australia's overseas aid programmes to offer aid recipients work opportunities in Australia as an opportunity to develop skills, earn wages to support their family and community and promote cross-cultural understanding. The scheme would also offer Australian employers the capacity to fill jobs.
- 1.65 Develop a trigger for investment in rural and regional communities that will intervene when those communities are in danger of spiralling into reduced employment, investment and development.



Business and employment structures

- 1.66 Require every business of a certain size to have a community council, like a sustainability council. This council would provide advice on the principles of the business, inform its stakeholders of company values, supporting worker transitions into and out of the workforce, and consider the needs of the community the business serves and from which it obtains its workers.
- 1.67 Regulate the labour market for all workers, without artificial concepts of master–servant. Industrial relations regulation is based on legal concepts that are no longer relevant and does not fit the shape we have now—for example, independent contractors.
- 1.68 Continue to develop industry and infrastructure in remote Australia and broaden the labour market. Provide an incentive to small to medium-sized enterprises to develop in rural and regional areas. Provide tax incentives to employees to work there.
- 1.69 As a no-cost option, change the structure of the workplace to support those struggling to participate—such as carers and Aboriginal people. A good change would be to move from the 9 to 5 Monday to Friday approach to a more project-based approach. The Productivity Commission has shown that 70 per cent of jobs could be more project based. This employment pattern could tap into a variety of skills, such as nursing, construction and legal skills.
- 1.70 Establish a national awards scheme for organisations proactive in training and employing Indigenous people.

Science, innovation and digital

Broadband

- 1.71 Roll out broadband across Australia.
- 1.72 Rethink the investment strategy for the roll-out of broadband: there is some concern that the development of a national broadband network by the private sector has been sub-optimal. On the other hand, reliance on public investment requires careful consideration because it entails highly sophisticated planning and investment and direct knowledge of the market. The unwinding of government monopolies in infrastructure in the early 1980s provides a useful benchmark.
- 1.73 The government should issue bonds to superannuation fund managers to fund the broadband network roll-out. Bonds could be issued for up to 1 per cent of superannuation funds under management and funds raised could be used to invest in broadband. The government would need to ensure that the scheme provided a return to investors.

Mobility and internationalisation of the innovation system

- 1.74 Adapt PhD training to improve the capacity and willingness of PhD students to move between sectors. The current approach to PhD training does not facilitate movement between academia and business and back again. This could be complemented by identifying and removing barriers to movement within the innovation system. One approach could be to have joint appointments to universities and organisations such as CSIRO or other bodies here or overseas.
- 1.75 Mobilise the Australian diaspora. The nation now has a diaspora of around 1 million—some 5 per cent of the population. Look at whether government funding could be used to develop a system to encourage the diaspora to contribute more to Australian innovation. It should be noted that the Taiwanese carefully manage relationships with their diaspora. A broader view of the diaspora could include those who have studied here: they are often sympathetic to Australia and among them are a number of future leaders of their home countries.

- 1.76 Develop a 'pipeline' for Australians abroad to transmit their knowledge and experiences back to Australia. Fostering links with Australians abroad will generate ideas and innovative pathways to develop productive ideas. Consider scholarships to encourage Australian researchers to return to Australia, even if only temporarily.
- 1.77 Introduce 'guidance principles' for the government's approach to encourage R&D and innovation rather than micro-management of processes and funding.
- 1.78 Use clusters—along the lines of California's Silicon Valley—to encourage international connections for R&D and innovation personnel.

Science and mathematics

- 1.79 Require more teachers to be science and mathematics literate, to enable them to excite kids with the subjects' potential. Research is telling us that we have an acute shortage of science and mathematics graduates.
- 1.80 Ensure that education resources take account of long-term industry needs, especially through occupations and professions that can spawn further growth and productivity—science and mathematics graduates, for example.
- 1.81 Adopt a systemic approach to science and mathematics. Make sure our teachers are well trained to teach in the disciplines. We need to make it interesting and lucrative to enter these areas of study.
- 1.82 Conduct more research into what skills are needed.
- 1.83 Introduce a national numeracy standard, similar to a literacy standard.
- 1.84 Boost the teaching of Asian languages (particularly Mandarin) in primary and secondary schools to promote ourselves within our region.

Investment in R&D and non-R&D innovation

- 1.85 Aim to double investment in R&D by 2020.
- 1.86 Require only 80 per cent of public R&D funding to be accountability based. The remainder should be trust based in order to free some of our best scientists of having to prepare grant applications and enable them to spend their time doing research instead.
- 1.87 Increase public and private sector combined investment in R&D to 3.6 per cent of GDP and keep it at that level until Australia is among the top investors in R&D in the OECD.
- 1.88 Instigate a fundamental change in education to support innovation and entrepreneurship from the earliest years of schooling.
- 1.89 Reduce the fear of failure. There is sometimes a culture within industry and community which inhibits innovation.
- 1.90 Encourage innovation through having the education system support the creative arts. By encouraging imagination, the creative arts are fundamental to engendering creative capacity and innovation. All parts of the economy need to embrace innovation: some firms face the difficulty that downstream intermediaries or retailers might not accept innovative new products.
- 1.91 Base government procurement on specification of expected performance. Such advanced contracts could be a useful means of driving innovation.



- 1.92 Encourage scientists to stop doing R&D and spend a year implementing the ideas they have developed.
- 1.93 Expand the Prime Minister's idea for a one-stop shop for early childhood services to encompass 'life learning centres' in suburbs and regional centres. People could continue to use the centres beyond childhood to seek out information, including on returning to the workforce and life-long learning opportunities.
- 1.94 Use the tax system to encourage collaboration.
- 1.95 Help businesses plan for their skills needs. Businesses need to take more responsibility for ensuring that their skills needs are met.
- 1.96 Release latent value in the innovation system by re-examining our curriculum architecture, working with business, and developing patterns of thinking that can cope with the envisaged conditions of 2020.
- 1.97 Establish an 'Innovation Summer School' for students during their holidays to inspire creativity.
- 1.98 Use the Golden Guru concept beyond business: the concept could also be useful for engaging experienced retired members of the community in schools.
- 1.99 Develop Centres of Excellence based on PhD-level studies.
- 1.100 Establish a national digital fund to continue to expand Australia's broadband.