



Centre for the Study of Higher Education

Education, Science and the Future of Australia

A Public Seminar Series on Policy

AUSTRALIA'S HUMAN CAPITAL – EDUCATION, SCIENCE AND INNOVATION: THE BRICKS AND MORTAR

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Introduction

Could I acknowledge Professor Peter McPhee; also John Roskam who will speak at the conclusion of this series. I am delighted to be asked to help set the scene for what promises to be a fascinating series of seminars on national policy and global strategy. Professor Shih gave us an excellent perspective on the rapid changes happening in education, science and innovation across the Asia-Pacific. I would like to complement this with a look at some of the big policy challenges facing Australia, and the global context we must consider in meeting them.

My main message tonight is that in addressing such challenges, one of our foremost policy priorities must be to develop our human capital – the capabilities of our citizens. This will require investment and reforms to improve health, raise workforce skills, and encourage and support workforce participation. As a nation, there are clear economic reasons for investing in human capital – and for doing so sooner rather than later. But it is not just the promise of a stronger economy that should drive us. A healthy, skilled and

motivated population, where all people have the opportunity to participate fully in the life of the nation, is a worthy goal in its own right – independent of its instrumental benefits for the economy.

The link between Australia's strength in education, science and innovation, and our ability to invest in our people in this way, should be plain. I will talk more about these links a little later on, but first I'll begin with a look at the policy issues currently shaping Australia. I will then discuss our international standing in education, science and innovation, and how we might need to position ourselves to compete in a changing world. Finally, I will talk about the particular challenges facing governments in developing national policy, with an eye to the global context.

Challenges to Australia's future prosperity

1. More competition in the international economy for Australia

Let's begin with the major policy challenges facing Australia. Over the last sixteen years, we have been riding a wave of continuous economic growth. This is largely thanks to two major waves of economic reform that opened up our economy and increased our business competitiveness. We have also benefited greatly from the commodities boom, particularly because of our proximity to major trading partners in the Asia-Pacific. The result has been an enormous increase in Australia's wealth and living standards.

But over the past few years, an increasing number of voices have been warning of the dangers of complacency. Having been levelled out through past reforms, the playing field is now shifting. Nations like China and India are rapidly building on top of that level playing field – constructing new factories, universities and science parks. In doing so, they are stripping away traditional sources of competitive differentiation and building new ones. In many cases, they are exploiting the opportunities created by change far better than we are.

This global realignment of power will have significant consequences – both economically and geopolitically. Technological change is also transforming the international economy. We are now competing in a world where traditional barriers of geography, time zones and transportation are being steadily eroded. Technological progress is a good thing, in that it drives productivity improvements. The challenge is to take advantage of it – to make it work for our citizens, our businesses, and our nation.

At the moment, however, Australia is in a comfort zone. As a recent Economist article put it, our boom could prove a "winner's curse", unless we begin adequately investing for the future.¹ The Victorian Premier has recognised this imperative, and has championed a National Reform Agenda that places human capital at its heart. I will discuss this reform agenda in more detail later.

2. Ageing population

The second major challenge facing Australia is the demographic shift caused by our ageing population. We are living longer, the birth rate is declining, and the average age of workers is rising. Forty years from now, one quarter of Australians will be 65 years or older, roughly double the present proportion. Among other economic implications, this is likely to result in reduced workforce participation.

Australia's workforce participation is already low by OECD standards. As more people move into older age groups, overall participation rates are projected to drop from around 64 per cent, to 56 per cent by 2044–45. Our ability to compete with better performing countries relies on increasing workforce participation, particularly among older workers and those with a low skills base. My fear is that we continue to understate the scale of this challenge, and the extent to which we need to invest in adult skills to meet it.

Australia's productivity levels are also well below those of the best performing countries in the OECD. Some of this can be explained by the scale, natural advantages, and access to foreign capital of leading countries. But all this tells us is that we have to work harder at those factors of competitive advantage that we can influence.

3. Productivity slowdown in an uncertain environmental future

Australia's productivity slowdown is in the context of an uncertain future, particularly with respect to our natural environment. The challenge of climate change cannot be overstated. We need to drastically cut our greenhouse gas emissions, but even if we succeed in doing so, climate shifts are already in motion. Adapting will require some fundamental changes – to the way our economy operates, to our patterns of consumption, and to the manner in which we address global problems.

The implications of climate change have been brought home in Australia with our domestic water crisis. There is a clear expectation that governments should be acting to address this critical threat to our nation's future. In Australia, discussion continues to focus on the potential costs of acting on climate change. Strangely, part of the picture is consistently missing from public debate. A discussion paper released by the States and Territories National Emissions Trading Taskforce last year indicated that the impact on GSP for Victoria of an emissions trading scheme for the stationary energy sector would be between 0.5 and 0.8 per cent lower than business as usual in 2020. If we consider the potential 11 per cent GDP growth we could achieve through the National Reform Agenda, the cost of change is seen in much better perspective.

Tackling climate change will be one of the most complex policy problems faced by the world's economies. Efforts to cut emissions clearly need to be

internationally coordinated. But there will also be a crucial role for local innovations that lead to improvements in the way we use natural resources. It is a problem that needs to be addressed from the level of the individual and the community, right up to the global economy.

How can governments meet these challenges?

I've outlined just three challenges facing Australia – our economic competitiveness, our ageing population and changes in our environment – but there are many more that we could consider. International security and the rise of terrorism. The liberalisation of product and labour markets. Growing competition in global supply chains.

A common theme among these challenges is the rapid and discontinuous nature of change. This leads to new, and suddenly crucial, policy issues. It also raises fundamental questions for governments. How do we prepare for an uncertain future? How do we acquire and develop our capacity to adapt to change? And how do we act on the opportunities generated by change? Our ability to do all of these things relies on us developing our most important economic resource – our human capital. To be competitive, to be more productive, and to come up with solutions, we need creative, skilled and engaged people. The importance of education, science and innovation in achieving this is manifest.

How is Australia measuring up?

So how is Australia measuring up in these critical areas? Let's start with education.

Education

Nothing shapes human capital more than education and training. Education drives prosperity and enables people to enjoy productive and rewarding working lives. Beyond economics, governments also have a responsibility to build, as much as possible, each individual's human capital. Amartya Sen, for example, has argued that governments should be measured against the capabilities of their citizens. And one of the most important products of an educated population – knowledge – is the most powerful tool we have to address some of our biggest policy challenges.

1. Early learning

We know that investing in early education – the first few years of life – can have substantial effects on future health, educational outcomes, and workforce participation. Yet Australia is at risk of being left behind in what is arguably the most important area in building human capital. Both the United Kingdom and New Zealand have a coherent national commitment to early childhood. Canada's experience shows that it can be done in a federation.

We have seen some recent nods towards the importance of early learning, but do not, as yet, have a comprehensive federal approach that would see universal access and standards implemented across Australia.

2. Schools

At the next stage of learning, in schools, Australia performs very well at an international level. But we have some enduring equity issues – there is a long tail on performance, especially compared to similarly high-performing countries like Finland, Canada, and, in the Asia-Pacific, Japan, Korea and Hong Kong-China.

We made enormous strides in lifting school performance and Year 12 or equivalent completion throughout the 80s and 90s. In Victoria, we've been focusing on it; our efforts have been bearing fruit; and our completion rate is now the best of all Australian states, currently standing within a very few percentage points of Victoria's target for 2010 which is 90%. But Australia has begun to plateau in this area. Other countries are doing much better. Japan and Korea, for example, have dramatically improved their secondary education completion rates, and are now in the top three OECD countries. We have plateaued because we have hit the groups suffering from entrenched disadvantage – young people from rural areas, those with disabilities, those from regions of low socioeconomic standing, and Indigenous youth. These are the people who stand to gain the most from engagement with the education system. We need to work harder and more creatively to reach these groups.

The transition from school to work or further study is another area where we need to direct particular energies. In Australia, failure to complete Year 12 results in a higher and more persistent level of unemployment than all other OECD countries, bar one. We need more flexible educational pathways to Year 12 or equivalent-level qualifications, and beyond, to encourage young people to stay in the education system. Part of this is about increasing vocational education and training capacity, which we have seen some encouraging signs of recently.

A recent report by the States and Territories on the future of schooling in Australia picks up on this need for flexibility. To remain competitive, schools need to be focusing on the unique learning needs of each student. Quality – of teaching and school leadership – is also a critical issue – it is the largest in-school determinant of variation in student achievement. We especially need to enhance the way we recruit and retain high-performing teachers. The Victorian experience suggests that the most effective strategy to improve teacher quality is to build the capacity of leadership groups in schools. This hugely outranks the narrower issue of performance pay for teachers – an area that has received considerable attention of late. Performance pay for teachers is merely the soft leading edge of AWAs.

3. Higher education

The role of higher education in the achievement of national policy goals is more important than ever. Professor Glyn Davis has been one of the most eloquent voices in this debate, and it is fitting that it is here at Melbourne University that we are witnessing the most significant shift in Australian higher education in decades. The introduction of the Melbourne Model next year speaks directly to the need for universities to respond to a changing global context. It aligns with international educational structures, and promotes an education characterised by depth, breadth, and strong transferable skills. The seismic shift at Melbourne University will likely result in greater differentiation of institutions across Australia's higher education system. And if we start to see more flexible, personal pathways throughout schools and vocational training, then higher education systems will also have to respond. However, caution is also required. I doubt the prescriptions of the Melbourne Model will work for vocational education and training.

4. Adult learning

A new set of pressures on the education system will also arise from adult learners. It is becoming increasingly clear that all of us need to keep learning throughout our lifetimes. There are two major shifts in the national and global economy that are important. One, there are an increasing number of jobs in industries requiring high skill levels. Over 50 per cent of employment growth is projected to come from fast growing, highly skilled industries. Two, *all* industries are undergoing a shift towards a need for higher skills, often as a result of a shift in the point in the value chain which Australian firms most occupy to succeed.

So we have an economy that is demanding higher and higher levels of skills. But Australia has a relatively low skilled workforce. Only about one-third of people who went through school in 1980 gained a Year 12 qualification. Those people are now about 45 years old. Some will have alternative qualifications, but a huge proportion – a larger proportion than almost all other developed nations – have not acquired a Year 12 or equivalent qualification. These people, who should have at least two decades of working life ahead of them, are going to find the labour market increasingly difficult. Unskilled workers can expect to work between 7 to 9 years less than those with some form of higher education.

This sits alongside the need to upskill even those workers with higher skill levels to meet industry needs. Governments need to begin looking at new ways to maximise investment in adult learning and maximise the effectiveness of that investment. On a broader level, we need to start having the debate about whether the universal provision of schooling needs to extend forward, beyond primary and secondary school to adult learning, as well as back, to early childhood. This is a controversial question which I don't intend to explore further here tonight. But in short, it is time to fundamentally re-think

Australia's education policy – to consider if and how it is meeting both our individual and our collective needs in a changing global context.

Science and innovation

Let's turn now to Australia's performance in science and innovation. Achievements in science and innovation, especially in technological change, go hand in hand with a skilled workforce. These require a strong human capital platform. But, coupled with education and training, they also build upon this platform, setting up a reinforcing cycle that drives further achievements. The OECD estimates that in advanced industrial economies, innovation and the exploitation of scientific discoveries have accounted for 50 per cent of economic growth. They are likely to be even more critical over the next two decades.ⁱⁱ

1. Science

Australia performs strongly relative to the OECD average on productivity, scientific input and output, and workforce measures. But like most OECD countries, Australia is experiencing significant shortfalls in science, engineering and technology skills. We currently rank 22nd out of 23 OECD countries in the growth of new science and engineering degrees.ⁱⁱⁱ This is a serious problem for a country looking to re-invent itself with a highly skilled, innovative, global workforce. It is especially serious when we consider the astonishing level of investment taking place in the Asia-Pacific region, where science and technology parks have been a key factor in raising national expenditures on R&D. Internationally, Australia's gross expenditure on R&D is below the OECD average. We are being outflanked by most countries, including the US, Japan, Korea, Finland, Germany and France.

2. Innovation

The bigger issue, however, is our limited commitment to business innovation. Compared to other countries, Australia spends relatively more on R&D in government and higher education sectors and less in business. This reflects a traditional focus in Australia towards advancing scientific research and knowledge and using that knowledge to address critical regional, national and international challenges.

But innovation is more than R&D. It takes place right across the economy. It is both the development of knowledge and the adoption and application of knowledge. And business and industry are the key players in this process. Australia needs to strengthen industry-science linkages, and increase the leverage of our public investments in R&D through better partnerships.^{iv} It is worth noting that less than 2 per cent of the world's new knowledge is developed in Australia. Even a concerted effort to boost our R&D capacity is unlikely to significantly boost this figure.

But domestic investment in science and innovation remains critical to generating solutions to our local problems and to enabling the absorption of

'imported' knowledge, ideas and technology.^v What we must recognise is that we need to be grasping the opportunities created by new knowledge elsewhere in the world. We need to develop our own path, by tapping into networks and forming broader partnerships. We need commitments to science and research that encourage entrepreneurship and creativity, and that strengthen linkages. More consideration should be given to the use of tax incentives for firms to invest not just in R&D, but also in skills development. Having levelled the playing field, we need to be building on it as actively as others are. And we need to recognise that innovation is something that occurs in all sectors of the economy. The ability of the workforce to innovate is the key to responding to the kinds of complex challenges we outlined earlier.

What can government do? What are we doing?

National Reform Agenda

The good news is that governments broadly agree on at least some aspects of what needs to be done. Since 2005, the Victorian Premier has been advocating a program of national reform that places a new emphasis on investing in human capital. The imperative for reform has been recognised by all governments through the Council of Australian Governments. The Productivity Commission has indicated that this National Reform Agenda, if fully implemented, could drive an increase in the nation's GDP of up to 11 per cent within 25 years. Crucially, the majority of benefits will arise from new investments in human capital.

As a nation, we are fast approaching a crossroads. We need a greater sense of urgency and ambition for Australia's future. However, we face a very real challenge in maintaining discipline in our economic reform efforts. Complacency is easy, and, in the world of the short-term electoral cycle, all too prevalent. Despite all Australian governments recognising the imperative for reform, there has not yet been a firm commitment from the Commonwealth to the human capital agenda, nor to the approach to better integrated service delivery and incentives which is central to it. While the States and Territories have agreed to continue to progress the National Reform Agenda, operating without the Commonwealth will drastically slow our efforts.

Federalism

Beyond the National Reform Agenda, it is important to consider that in a federal system, how effectively governments work together shapes a range of policy areas. This extends far beyond the traditional state/federal divisions. In Australia, we are increasingly seeing a shift from competitive and cooperative federalism to "opportunistic federalism", with the Commonwealth using its powers to selectively intervene in areas of traditional State responsibility. The message seems to be that federalism is a broken system. Yet an interesting report released in April this year showed that, contrary to the common conception of wasteful duplication, the policy diversity of federalism can actually drive competition and innovation. Internationally,

federations have also consistently outperformed unitary states in economic terms. The same report estimates the financial benefit to Australia from being a federation in the order of about 10%. This advantage can be even greater, depending on the level of fiscal decentralisation. In short, the benefits can far outweigh the costs, if you have governments that are prepared to work together.

What does this mean for governments of the future?

The key point – the ability to work with a diverse set of players to solve complex problems – is an important message for governments of the future. Governments will continue to be beset by entrenched or complex problems that need innovative approaches. And governments have an integral role to play in addressing these kinds of problems because they are the only stable, underlying institutions in a position to secure the country's future. This is not to argue against the central role of private markets. But it is to acknowledge that the reliance on markets alone will create a Hobbesian world which our democracy will not accept. Just consider the cost and equality of health care in the United States, if you have any doubts.

International trends

We can learn a lot from countries that are performing better than Australia in the areas that matter. High-performing countries appear to share two factors. One, they are characterised by open systems – of economy and politics – that reward performance and innovation. Two, they have high levels of capacity – in their human, social and organisational capital, and in the quality of their institutions. Both these factors are about managing connections and knowledge.^{vi}

We can also learn a lot from international trends towards delivering more responsive and effective government services. There are some clear themes, including better integrated services that respond to individual needs; the need for innovation within government; and government partnering with other sectors to deliver the best possible result. The clear message is that governments are going to have to build their adaptive capacity. We are going to need to establish policy as a learning process and create policy frameworks that enable partnerships, encourage innovation and share learnings. Clear and agreed outcomes which are transparently measurable are often the best means of turning aspirations into action. We need to develop the innovative capacity of governments, and create an ability to create and tap into knowledge networks. And most importantly, we need to be receptive to policy possibilities from non-traditional sources. Governments of the future must be able to partner constructively with diverse players. Government may, in many ways, have to be re-imagined.

Conclusion

We have covered a lot of ground in this presentation, but I hope you come away with a real sense of the importance of a human capital agenda to our Australia's future. Education, science and innovation are fundamental parts of the equation. It is clear that we have a lot of work to do to realise our nation's full potential. But I think there should be a strong sense of optimism for the future. We know where we need to go. Now we just need to get there.

ⁱ "Howard hears the voters grumble", *The Economist*, May 12th, 2007.

ⁱⁱ See for example: OECD (February 2006), *Economic Policy Reforms: Going for Growth 2006* and OECD (January 2004), *Benchmarking Innovation Policy and Innovation Framework Conditions*.

ⁱⁱⁱ Combet, G (December 2005), *Repositioning Australian Manufacturing in the Global Economy*, National Manufacturing Summit

^{iv} OECD Going for Growth 2006

^v OECD (2000), *A New Economy? The Changing Role of Innovation and Information Technology in Growth*

^{vi} Geoff Mulgan, presentation to ANZSOG