Education, Science and Public Policy

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Ideas for an Education Revolution

Edited by Simon Marginson and
Richard James

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Simon Marginson
Professor of Higher Education
University of Melbourne
30 October 2008

Introduction

Simon Marginson

This is a book of signposts to an education revolution. The chapters have been prepared by a diverse group of leaders and scholars in government and education. They converge remarkably on the same group of messages. In clear-minded, evidence-based prose they catalogue the state of the nation in education, training and university research. They develop ideas for new policies and innovative federal programs that can address longstanding weaknesses in Australia's effort.

Education, Science and Public Policy is published at a key moment in Australia. The election of the Rudd Labor government generated a surge of expectations among the community that the long neglect of education, training and research issues was over. Kevin Rudd came to power committed to an 'education revolution', the main positive concept that was advanced during the election campaign. These chapters were prepared originally as speeches during the pre-election period. The chapters have since been slightly updated to take account of the change of government; but there was surprisingly little change in the substance of the papers because the Rudd government has yet to put the commitment to an 'education revolution' into practice. Little was done in the first Labor budget in May 2008, which confined itself to specific pre-election commitments at modest fiscal

cost rather than the larger scale renovation promised by the 'education revolution'. The issues are too large to be disposed of quickly, and policy, and policy priorities and strategies, are still evolving. In a modest way the book is designed to assist this process.

The Rudd government's position

During the 2007 election campaign Labor issued a short list of immediate risk-free funding commitments, avoiding the kind of 'revolutionary' investments that would have exposed it as a target for big spending jibes, but it nevertheless focused pointedly on the decline in the public funding of education under the Howard government, as evidenced in the comparative international data. The implication was that Labor would engineer a significant long-term growth in national outlays on education and innovation so as to restore comparability with other countries. The incoming Prime Minister said as much. After the election the education portfolio was taken by the Deputy Prime Minister, Julia Gillard, signifying its place at the top of the government's priorities.

Labor's in-principle commitment to education, training and research is grounded in its overall economic and social policy. The Australian Government sees workforce skills as the key to productivity advance, meaning that it is essential to push year 12 retention at school towards universal levels, raise participation in tertiary education, improve quality at all levels, and enhance skills in information and communications technologies. Likewise the government sees innovation as the key to global competitiveness in industry and to the capacity of the nation to meet mega-challenges such as climate change, water, energy, the contraction of agriculture, the growth of cities, security, and intercultural relations in a globalised world. This century is likely to see the end of the Holocene and the transition to a hotter world and a drier Australia, in which food, population and infrastructure issues will press closely. All of this puts basic university research at the centre of policy, along with links between research and industry and the facilitation of the broad social dissemination of knowledge that is crucial to the shaping of new behaviour.

By adopting this position the government has set a benchmark for itself. But in any case it is certain that national governments in this period will be judged by the extent to which they build a wide and

deep capacity in education and research. This is also the century of the knowledge economy. On the world scale, the 'education revolution' is already more than an election slogan. Here the Howard government, which placed education on the back burner except where votes were directly at stake, was out of step with global trends. The Rudd government's position is broadly similar to that of the stronger nations in Europe, especially in Scandinavia, the Low Countries and the Germanic world, Canada, and the rising Asian knowledge economies in China, Singapore and Korea. It is also the policy position advocated by the global policy organisations, the Organization for Economic Cooperation and Development (OECD), UNESCO and the World Bank. Already many nations have sharply increased their investments.

Above all, China has upped the ante on the education revolution. Between 1998 and 2005 the number of students enrolled in tertiary education in China rose by an extraordinary 4.4 times to 15.6 million, not far short of the total tertiary enrolment in each of the USA and the European Union. The rate of school leaver participation in China has risen from 3 to 20 per cent since 1990. China will soon have the largest annual output of tertiary graduates in the world and the majority of PhDs in science and technology. At the same time China has lifted the quality of its institutions and created a layer of top research universities. The annual number of research papers published in international journals rose by 4.5 times between 1995 and 2005, and the level of investment in basic research in its universities is already third largest in the world after the USA and Japan and rising.

In a paper for the National Bureau of Economic Research in the United States, 'The higher educational transformation of China and its global implications' (2008), Yao Li and colleagues suggest that China's accelerated investment might generate a global 'arms race' in investment in innovation:

> Previous efforts in other countries to use educational transformation as a mechanism either to maintain high growth or to initiate episodes of high growth have generally been regarded as unsuccessful, but the focus has been primary and secondary education, not tertiary. In China's case, these latest efforts seem to be motivated by a desire to maintain

> high growth by using educational transformation as the primary mechanism for skill upgrading and raising total factor productivity. If China succeeds, other countries may follow with higher educational competition between countries as a possible outcome.[1]

In other words, if China maintains a rate of economic growth that remains considerably above the world average while making the transition to a tertiary-educated society, then the high investment model will become globally hegemonic, whether or not the growth is primarily due to education and research. The USA is almost certain to respond in competitive terms, by upping its own investment in education and research, even though it is already the world leader. In the wake of this, no government will resist the 'education revolution'. At the same time, economic and cultural trends will also drive it, inside and outside the policy sphere. It is becoming apparent that a nation left outside the dynamic of continuous improvement in education and knowledge will face difficulties. Not only does it become increasingly dependent on knowledge sourced from elsewhere but also it is unable to solve its own problems. At the same time the serious work of government, in the face of intractable global and local problems, becomes much more difficult in a society in which advanced education remains the preserve of a minority, evidence-based policy has little standing with the media and the bulk of the people, and politics is confined to an electoral auction over tax cuts and special payments to targeted groups of voters, with little policy discussion.

In this context there is nothing remarkable about the Rudd commitment to an enhanced national effort in education, training and research. The government's position is nothing more or less than mainstream international practice. The question is whether this commitment will be followed up with an investment that can really transform education and innovation.

It is already apparent that translating that commitment into actual policies and programs, in the political context of a tight fiscal regime, three years of tax cuts, rising fuel prices and an economic downturn, is not easy to achieve. The first Labor budget provided for the pre-election promises of computers in government schools, vocational training units in schools (the largest single education promise

in dollar terms), the abolition of full-fee programs for local undergraduate students, an increase in scholarships for needy students, and medium-scale increases in research scholarships and fellowships. There was a half billion dollar allocation to infrastructure in higher education, additional to the election commitments. Most of the larger policy areas were left untouched, including federal support for vocational education and training (VET), the Higher Education Contribution Scheme (HECS) funding rates, tertiary student assistance, and basic research grants.

Some of these matters awaited the outcome of two federal government reviews in train when the 2008 budget was brought down. The first of these reviews, that of the innovation system, reported in September 2008, and at the time of writing the government's response to that review was awaited. The second review, that of the higher education system, was due to complete its work by the end of 2008. In tertiary education and university research—policy areas where the federal government is the primary government—the first opportunity to implement a new regime is the May 2009 budget.

Scale of the problem

Given that education, training and university research are still in much the same condition as at the end of the Howard years, it is useful to review what this means.

In 2004 Australia spent 5.9 per cent of its gross domestic product (GDP) on education. This was still a little above the OECD average of 5.7 per cent but, as Barry McGaw notes in chapter 4, international averages hardly constitute the gold medal standard. The USA, the world's leading knowledge economy, invested 7.4 per cent of GDP in 2004. The international data also suggest that Australia is overly dependent on private investment in education, where the benefits are captured on an individual basis by a small part of the population. Australia was the third largest private spender on education in 2005. It is also a relatively low public spender on education at 4.3 per cent of GDP, compared to the OECD average of 5.0 per cent, the level that applies also in the USA and UK.[2]

Australia's public spending on education as a proportion of GDP is at 22nd place of the 29 OECD countries that provide data. It is public investment, rather than private investment, that underpins

common school and tertiary education systems of good quality, and supports basic research, which is the foundation of national innovative capacity.

In early childhood education, Australia is at the bottom of the OECD table. As Collette Tayler notes in chapter 3, in 2004 Australia spent 0.1 per cent of GDP on the early learning of 3–4 year olds compared to an OECD average of 0.5 per cent, and 0.9 per cent in Denmark. We staff our preschools with the worst-paid teachers when they ought to be among the best. A strong foundation before age five is crucial to everything that follows.

The families with the best access to early learning are those that can afford to pay for it privately. The legacy of this fragmented educational preparation of preschoolers, compounded by a divided school system of uneven quality, is the long tail of under-achievers who are carried all the way through the educational system. This translates into poor basic literacy, a high drop-out rate in the upper secondary years and lower productivity at work. Comparative testing shows that average student achievement in Australia is good by international standards, but the bottom cohort is significantly weaker than that in Canada, Korea, Finland and some other European nations (see chapter 4).

Looking at the public funding of tertiary education, in 2004 Australia was a relatively low public investor at 0.8 per cent of GDP compared to the OECD average of 1.0 per cent. Australia was 25th of the 29 OECD countries for which data are available. Between 1995 and 2004, in the average OECD country public funding of tertiary education rose by 49 per cent. Increases of more than 60 per cent occurred in several nations pursuing 'catch-up' policies of capacity-building in what have been relatively under-provided tertiary sectors. Ireland (108 per cent) and Switzerland (76 per cent) also benefited from substantial extra funding. In the USA public funding of tertiary education rose by 54 per cent, in the UK 6 per cent. In Australia it fell by 4 per cent, although student numbers rose by a third. This is an extraordinary outcome and a crucial problem for the nation.

Higher education is now just 41 per cent government funded, and fee-based courses have been pumped up to fill the gap. A quarter of students are fee-paying foreign students, which is distorting priorities. While the number of international students has risen to three times the level of the mid 1990s, the participation of domestic

students is flat, tuition charges are among the highest in the OECD, student assistance payments are at their lowest ebb for four decades, and almost three-quarters of full-time students have to work during semester, mostly in areas unrelated to their program of study. Many say that the hours they are working are negatively affecting their studies.

The low level of public funding of universities is also of particular concern in relation to basic research that depends heavily on this source. Research cannot be substantially funded from foreign student fees, which are mostly ploughed back into the business. Our investment in basic research appears less than fully competitive in world terms (see chapters 7–9). Australia has two research universities in the world's top hundred, the Australian National University and the University of Melbourne, but the UK has 11, Canada and Sweden each have four, and even tiny Switzerland has three (see chapter 6).

At the same time funding levels and learning conditions in VET are worse than in higher education. Australia was once a world leader in student participation in tertiary education, but we have fallen back to the OECD average. In Australia in 2005, 82.5 per cent of 15–19-year-olds were enrolled in education compared to an OECD average of 81.5 per cent. The Australian enrolment was above that of the UK but well below Korea and most countries in Western Europe. What is most interesting is the ten-year trend line in Australia compared to the rest of the OECD. In Australia there was little change between 1995 (81 per cent) and 2005 (83 per cent), yet the OECD average rose from 74 to 82 per cent. There were substantial rises in the enrolment levels of 15–19-year-olds in most other OECD countries.

In sum, there are at least seven areas of education, training and research where provision is so substantially deficient as to require a major investment of public funds. These are early learning, government schooling, vocational training, the rate of funding of university student places and the level of student charges, tertiary student living support, the infrastructure of institutions at all levels, and basic research capacity. Addressing these issues requires not just billions in national investment but also a more mature system of federal–state relations than we have seen, especially in schools and training.

A strategy for phased national investment over a period of time involves difficult decisions about priorities and mechanisms, and

invokes trade-offs. There is a danger that some sectors will be looked after and others neglected. There is also a danger that in an atmosphere of conservative fiscal politics the 'education revolution' will be consigned to the 'too hard', if not the 'too big', basket and Australia will slip further behind. Much depends on the quality of public policy-making and implementation, and of the agencies charged with that responsibility. Much will depend on whether public policy can take the long-term view, the comparative international view, the expert-driven view and the outcomes-driven view. And, one suspects, that in turn means that much will depend on whether an informed public can make itself heard in policy development. Governments do not operate in a political vacuum. In previous times, every major federal initiative in education in Australia has been underpinned by substantial and active public support.

The public policy seminars and the book

The chapters in this book had their origins in a series of five pre-election public policy seminars mounted by the University of Melbourne between June and August 2007 through its Centre for the Study of Higher Education. This was a public discussion whose time had come. The papers were stimulating, the discussions were lively and there was never enough time for all to be said. Those who took part in the seminars left them with a greater understanding of the issues, and perhaps a greater hope for the future.

The book has been drawn from the seminar papers, updated and edited so as to turn pre-election speeches into post-election chapters. With one exception (not included in the book) the speakers at the seminars provided written papers for this publication. The chapters cover most issues in education, training and research, although the universities have received more attention than other areas. Our intention in publishing the papers is both to inform current public and policy discussions and to provide a resource of enduring value.

Some material critiquing the then Howard coalition government was removed from the speeches because that material had lost relevance in the post-election situation. Nevertheless, not much extra work was required to update what were Howard-era speeches for the Rudd era. As noted, a year after the election of the Labor government,

the issues and problems discussed in the papers largely remain to be acknowledged and addressed. These issues constitute a major and bi-partisan challenge for the nation and an ongoing test of its public policy culture, its mechanisms of government, and its capacity to concentrate political will on the identification of problems, targets and solutions.

In the first chapter Terry Moran, then Victoria's chief public servant and a principal leader in policy on education, training and innovation, and now head of the Prime Minister's department in Canberra, provides an overview of the challenges and issues. In an argument that systematically covers all of the sectors concerned, Terry provides a grounded rationale for investment in human capital and innovation in the global context, and identifies some of the key policy difficulties and capacity constraints, including the structural and political problems of shared federal–state responsibilities.

In the second chapter Maxine McKew provides a reasoned and passionate argument for renewed policy attention to education and training, focusing especially on schooling. Maxine was an incandescent presence at the seminar and during the election campaign in the federal Sydney seat of Bennelong, which was then taking place. On election day, 24 November, Maxine secured a 5.5 per cent swing against the incumbent Prime Minister, John Howard, winning by 2434 votes. It was only the second time in Australian history that a Prime Minister has been defeated at a general election. In the first Rudd ministry Maxine McKew was named as Parliamentary Secretary assisting the Prime Minister with a special responsibility for early childhood education, an area that she addresses at some length in her chapter.

In chapter 3 Collette Tayler provides a definitive treatment of the research and policy issues on this new and vital policy terrain. It is clear that given the influence of early learning on later capacity, and given the cost of early learning compared to the costs of remedial education (and the cost of failure to educate), an enhanced emphasis on early learning is cost effective. In chapter 4 Barry McGaw, former Director of Education at the OECD, addresses the crucial issue of the comparative performance of Australian schools and students. Using the OECD's Program for International Student Assessment (PISA) data he finds that, contrary to some public claims, our schools do

very well overall. Nevertheless, learning in Australia is more uneven across the socioeconomic groups than in some other countries; and in the most recent PISA data from 2006 there are disturbing signs that not only are we slipping relative to our comparators but also in some respects the performance of our better students has declined in absolute terms. Barry provides a matchless set of data to tell the story.

The focus then moves to higher education and research. Shih Choon Fong, as President of the National University of Singapore at the time of the seminar program, headed one of the world's most dynamic universities In chapter 5 he provides an overview of the global university landscape and the strategic issues facing nations and individual institutions, including the rising importance of the Asia-Pacific region and the need to reconcile our awesome capacity in science and technology with the development of human ethics, and social and cross-border relations.

Simon Marginson (chapter 6) works through the problems generated by a decade of under-funding in higher education, coupled with frayed government–university relations and an over-dependence on the international student market. A key part of the solution is the creation of an Australian Tertiary Education Commission able to operate at arm's-length from day-to-day politics. Michael Gallagher (chapter 7) explores the potential for new policies and policy mechanisms that are able to transcend past neglect, forge a new political goodwill, and meet the need for long-term thinking and global effectiveness.

Finally, two of Australia's vice-chancellors address issues and problems in innovation and research. Margaret Gardner from RMIT University (chapter 8) works through the policy issues. Margaret argues that Australian research policy has been unduly focused on allocation mechanisms for a constant cake and that we need a greater emphasis on capacity-building if we are to keep pace with other nations. Ian Chubb from the Australian National University (chapter 9) calls for a renewed emphasis on long-term policy planning (a recurring theme through all the chapters), draws out the crucial importance of building capacity in our strong research universities on the global stage, and uncovers gaps, distributional anomalies and perverse incentives in current policy.

Notes

1 Li, Y., Whalley, J., Zhang, S., and Zhao, X., *The Higher Educational Transformation of China and Its Global Implications*, NBER Working Paper No. 13849, National Bureau of Economic Research, Cambridge, MA, 2008, p. 4.

2 All data in the Preface are from Organisation for Economic Cooperation and Development (OECD), *Education at a Glance 2007*, OECD, Paris. For further analysis of Australia's comparative position see Simon Marginson, *Education: Australia and the OECD*, Background Paper prepared for Australian Policy Online, at http://www.sisr.net/apo/election_education.pdf (accessed 21 October 2008).

Chapter 1

Education, science and innovation

Terry Moran, AO
Secretary, Department of Prime Minister and Cabinet, Government of Australia

'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.'

In February 2008 Terry Moran was appointed Secretary of the Department of Prime Minister and Cabinet, succeeding Peter Shergold. From 2000 to 2008 Terry held the equivalent position in Victoria as Secretary of the Department of Premier and Cabinet after leading roles in education and training in Victoria, Queensland and the federal sphere. He has had a long-standing interest in the improvement of federal–state coordination in government. He delivered this chapter as a public paper on 25 June 2007 while serving as public service head in Victoria.

Introduction

In this chapter I want to look at some of the big policy challenges facing Australia and the global context we must consider in meeting them.

My main message 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, in which 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 say more about these links a little later on, but first I'll 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

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 by

means of 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.

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, a 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.

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 cut our greenhouse gas emissions drastically, but even if we succeed in doing so, climate shifts are already in motion. Adapting will require some fundamental changes: changes to the way our economy operates, changes to our patterns of consumption, and changes 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 gross state product (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, including

international security and the rise of terrorism, the liberalisation of product and labour markets, and 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? Education

So how is Australia measuring up in these critical areas? I will start with 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.

Early learning

We know that investing in early education, in 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.

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 1980s 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 per cent. 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, of which we have seen some encouraging signs recently.

Recent policy thinking in the states and territories on the future of schooling in Australia picks up on this need for flexibility. To remain competitive, schools need to focus on the unique learning needs of each student. Quality of teaching and quality school leadership are

also critical issues as these are the largest in-school determinants 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 Australian Workplace Agreements.

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 in 2008 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 would work for vocational education and training.

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. More than 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 that Australian firms must 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 a 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 in 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 seven to nine 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 debating 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 that I don't intend to explore further now. But in short, it is time to fundamentally rethink Australia's education policy, to consider whether and how it is meeting both our individual and our collective needs in a changing global context.

How is Australia measuring up? Science and innovation

Let us 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.[2]

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.[3] This is a serious problem for a country looking to reinvent 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.

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.[4] 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.[5] What we must recognise is that we need to grasp 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 build 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 complex challenges of the kind we outlined earlier.

What can government do?

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.[6] 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 that is central to it. While the states and territories have agreed to continue to pursue 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 intervene selectively in areas of traditional state responsibility. The message seems to be that federalism is a broken system.

Yet the policy diversity of federalism can actually drive competition and innovation. Some international evidence suggests that federations outperform unitary states in economic terms. The advantage can be even greater, depending on the level of fiscal decentralisation. In short, the benefits of federalism can far outweigh the costs if you have governments that are prepared to work together.

What does this mean for future governments?

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 problems of this kind 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 that 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 characteristics. 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.[7]

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 lessons. Clear and agreed outcomes that are transparently measurable are often the best means of turning aspirations into action. We need to develop the innovative capacity of governments and to establish 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 reimagined.

Conclusion

We have covered a lot of ground, but I hope you, the reader, can draw from it a real sense of the importance of a human capital agenda to 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.

Notes

1 'Howard hears the voters grumble', *Economist*, 12 May 2007.
2 See for example: OECD, *Economic Policy Reforms: Going for Growth 2006*, February 2006, OECD, Paris; OECD, *Benchmarking Innovation Policy and Innovation Framework Conditions*, January 2004, OECD, Paris.
3 Greg Combet, *Repositioning Australian Manufacturing in the Global Economy*, National Manufacturing Summit, December 2005.
4 OECD, *Economic Policy Reforms: Going for Growth 2006*.
5 OECD, *A New Economy? The Changing Role of Innovation and Information Technology in Growth*, OECD, Paris, 2000.
6 Productivity Commission, *Benefits of the National Reform Agenda*. Research Paper, released 28 February 2007, at: http://www.pc.gov.au/research/commissionresearch/nationalreformagenda (accessed 28 October 2008).
7 Geoff Mulgan, presentation to ANZSOG.

Chapter 2

Imagining and implementing policy

Maxine McKew, MHR
Parliamentary Secretary for Early Childhood Education and Child Care

'The importance of early childhood education extends into school life. The more quickly and effectively health or educational problems are addressed, the more benefit the child can derive from good teaching programs. The significant expense of early intervention will be more than repaid through less expense in later remediation. Economic flow-on benefits are obvious.'

Maxine McKew was elected to the House of Representatives on 24 November 2007 as the federal member for the inner-city Sydney seat of Bennelong. She defeated the then Prime Minister, John Howard. This was only the second time in Australia's history that an incumbent Prime Minister has been defeated at the polls. In the announcement of the first Rudd government Ministry she was appointed as federal Parliamentary Secretary for Early Childhood Education and Child Care. Maxine was formerly an ABC and *Bulletin* journalist and played a leading role in anchoring national policy debate on such television programs as *Lateline*. This chapter was first presented as a public paper on 27 August 2007, during the lead-up to the federal election.

Introduction

Australia has an undeveloped capacity to improve our productivity significantly through the development of human capital. Other chapters in this volume show that we have the ability to build a better future than today's educational and economic benchmarking and indicators would immediately suggest is likely, or even possible. In this chapter I focus particularly on the role of public policy in achieving the goals of a national government.

In my thirty years as a journalist I have had the privilege of studying up close what contemporary governments, especially Australian governments, can achieve, have achieved and have failed to achieve. My journalism has covered domestic and international policies in almost every field. It is time for me to move from the neutral, questioning stance of the journalist to apply what I have learned to the active arena of national government.

The underlying principles that I hope will emerge in my contribution are the importance of long-term policy and planning; the goals, both explicit and implicit, that underlie good and bad policy; and the urgent necessity of realising that no single policy exists in a vacuum. Good policies reinforce rather than undermine each other.

I also want to show how a new government, with a New Direction, a new purpose and a new set of priorities, can use undeveloped capacity and capability to improve our national prosperity significantly through equity in education. Fairness and equity are not merely a nice by-product of good policy. They are essential to prosperity and must be provided through sound policy. A government that prioritises fairness and equity in education will promote prosperity and growth more effectively than a government that views economics as a zero-sum game.

The Labor government's number 1 priority is to build a first-class educational system, from kindergarten through to graduate school, that is fit for a first-world economy. Australia will never fulfil its capacity when government makes education policy according to short-term goals, to grab headlines or to fight another agenda such as the debilitating battle between the state and federal governments. The Labor Party, in shaping its policy, has imagined a better future for Australia. It has studied the research evidence, enlivened by listening to the people whose lives make up the statistics.

Foundations for public policy

How government chooses policy priorities, and how it defines and explains them, determine both public understanding and social and economic outcomes.

The only valid and non-corrupt motivation for public policy and spending is the greater public good. For instance, genuine concern for health infrastructure in Australia requires careful spending on the hospital system and its staff in an orderly, coordinated way, rather an unresearched experiment outside a sound consultative process. But we are currently seeing ad hoc policy flaws in health, and we are also seeing them in education policy and in many other areas. We have wasted our prosperity gains of the last ten years and now face the extraordinarily difficult task of restoring infrastructure in health, education, transport, roads and other national needs that serve the economy. The great wealth generated by the commodities boom in Western Australia conceals the abandonment of tight money policies and the looseness of the ad hoc federal spending decisions that characterised the Howard years.

In designing economic strategy, it is important to remember that profits are only one part of the economy. The other is human capital, people and the lives they lead. Budgets, taxes and corporate profits have been the drivers of national policies in the last ten years. In contrast, the Labor Party recognises that a budget is only a tool for achieving other goals. By treating surpluses and profits as a means to an end, not as an end in themselves, we are better able to provide for long-term sustainable prosperity. For that reason Labor has made improving our education infrastructure its highest priority.

In the 1980s and '90s, the reforms of the Hawke and Keating governments prepared Australia for a period of extraordinary growth. Ross Gittins, writing in the *Sydney Morning Herald*, highlighted the luck of John Howard as Prime Minister and Peter Costello as federal Treasurer.[1] 'They inherited the economy after their predecessors had done most of the heavy lifting of economic reform, but before that reform had begun to pay off.' Gittins goes on to give policy reasons to explain why we are now hitting capacity constraints, and he laments that Messrs Howard and Costello have not 'paid more attention to the supply side of the economy'. Gittins concludes, 'We'd have a better educated workforce and fewer worries about shortages of skilled

labour if we hadn't been neglecting technical and further education and hadn't been using a 15-year squeeze on university funding to achieve de facto commercialisation of higher education.'

Gittins blames Costello's policy of, as he puts it, 'demonising all government debt and thereby creating a political climate that encouraged the states to under-invest in economic infrastructure'. He presents a compelling view of state–federal relations that explains why today we are confronted by crumbling infrastructure in roads, hospitals, public transport, schools, universities and research institutions. Much of the crumbling is in bricks and mortar, or even sandstone! But human capital has also been neglected.

In January 2007 the then Leader of the Opposition, Kevin Rudd, and the Shadow Minister for Education and Training, Stephen Smith, launched their paper, *New Directions*, on the critical link between long-term prosperity, productivity growth and human capital investment. This paper calls for 'a new national vision—for Australia to become the most educated country, the most skilled economy and the best trained workforce in the world'. If that sounds familiar and you thought we were already on our way to achieving such goals under the Howard government, consider international benchmarking that shows Australia having made good progress in the 1980s and 1990s toward these goals, but sliding backwards since the Howard government's election in 1996.

Between 1998 and 2005 Australia's labour productivity as benchmarked against the United States fell from a peak of 85 per cent to only 79 per cent, losing almost completely our relative productivity gains of the early 1990s. During this same period, we fell when benchmarked against our own performance as well. In 1998 we finished a five-year period of average annual labour productivity growth of 3.2 per cent. In the next five-year period ending in 2004, this annual rate of growth fell to only 2.2 per cent.

If we keep going as we are, we will confirm the 2006–07 Mid-year Economic and Fiscal Outlook statement of the Commonwealth Treasury, which downgraded its projected long-run average productivity growth rate from 2 to 1.75 per cent. A number of other expert reports confirm figures similar to these and agree that we have a projected productivity performance too low to guarantee long-term prosperity.

Neglect of education and equity

Good economic management of the country is not solely the responsibility of the Treasurer and is not confined to the balance sheet and the bottom line. The annual surplus in the national accounts masks gross mismanagement of those most important tools of economic management: education, educational equity and research.

Not only have we been going backwards since 1996, not only have we failed to build an education program designed for the twenty-first century, but also we as a nation have not understood the role of education in economic management or acknowledged the critical link between education, human capital and the future prosperity of our country. Nor have we grasped the international challenge offered by up-and-comers such as India, Finland, Korea and Hong Kong.

Australia is facing a silent killer: a negative growth in education and education equity. This is much more serious than negative growth in the stock market. While the stock market can return to new highs in the near future, losses in the education stakes will take much longer to recover. Without strong policy direction they won't be recovered at all. For the Australian children currently affected by educational neglect, the recovery will never come. Their lost opportunity will be compounded each year, never to be fully compensated.

OECD research shows that if the average educational level of the working-age population were raised by one year, the economy would be 3–6 per cent larger and the annual GDP growth rate would be 1 per cent higher. When this compounds, it makes a significant difference for the countries that reap the prosperity benefit, and it compounds the difficulties for countries left behind to catch up. Right now, that's us. Dr Peter Andrews, Queensland Chief Scientist, points out that to rise to the productivity level of Scandinavian countries Australia would need to increase the number of scientists and engineers in the workforce by 25 per cent, or at least from 500,000 to 700,000. This cannot be done quickly. As the OECD points out, it requires sustained large-scale investment across the human capital spectrum; that is, education, health, housing and similar supports for members of our society, otherwise called our workforce.

Investment in education

Let's look at the figures. How has Australian public investment in education fared since the mid 1990s?

From 1995 to 2004 Australia's public investment in tertiary education decreased by 7 per cent whereas the average increase by other OECD countries was 48 per cent. We moved 55 points down from the OECD average! Australia is the only OECD nation that has actually cut its public investment in tertiary education. Turkey and Greece more than doubled their expenditure between 1995 and 2006, while Australia hangs upside down and alone on the chart at 7 per cent negative. Commonwealth grants to universities have decreased from 57 per cent of the university's revenue in 1996 to 41 per cent in 2004. The Howard government claimed a 6 per cent increase in expenditure on tertiary education since 2001, but this claim ignored the 12 per cent increase in full-time students. If we had another hour, we could identify all of the multitudinous ways Australian university education has been damaged by under-funding.

In the most important area of education of all, the one that pays the highest dividends, early childhood education, we currently spend a miserly 0.1 per cent of GDP. This is a fifth of the OECD average level of spending on early childhood education. Yet we aspire not to be OECD average but to compare with the countries that lead the world—and those countries spend much more than the average.

An international study by Krueger and Lindahl published in the *Journal of Economic Literature*[2] has demonstrated the validity of this human capital view and shows that the return on early education is greater than later investments. Early literacy and numeracy build the child's confidence as a learner and prevent years of misery. Early foundations of learning are the strongest foundations.

If we take early childhood education and care into account, as advocated by Professor Collette Tayler (see chapter 3), by adding what we spend on child care to early education expenditure, I strongly suspect our figures would give a new meaning to 'downunder'. As well as being a very low spender on early childhood education, Australia is behind 17 OECD countries in spending on school-level education as a proportion of GDP.

Effects in the workforce

What about the workforce? Here is why we are facing workforce shortages. Too many of our children do not complete secondary school. Whereas the top performing OECD countries have 95 per cent or more school completion, Australia's retention to year 12 is 80 per cent. For Indigenous students, the current retention to year 12 rate is 40 per cent. Shame on us all.

In *It's Crunch Time*, a report released in August 2007, the Australian Industry Group and the Dusseldorp Skills Forum[3] urge Australia to aim for 85 per cent completion by 2011 and 90 per cent by 2015. We will still be way behind other countries. Looking ahead to 2040, Access Economics (2005) calculates that achieving a 90 per cent school completion rate by 2010 would contribute 65,000 more workers and expand the economy by more than $9 billion in today's money by 2040.[4]

It's Crunch Time points out that if by 2040 we have increased school and training retention rates among 15–25-year-olds to 90 per cent, the impact on the economy would be the same as increasing Australia's total immigrant intake by 180,000, or increasing workforce participation of older workers by 6.6 per cent, or boosting GDP by 1.1 per cent. This would represent an additional $500 per Australian in today's money. The increased school retention rates would also contribute $2.3 billion in additional annual taxation receipts by 2040.

Workforce and vocational training usually invoke images of blue-collar work and TAFE training. University education; TAFE training. Why not university training and TAFE education? Both are equally vocational and should be equally valued by our culture and our laws. In an odd sort of even-handedness from the Howard government, both have suffered from under-investment since 1996. Charles Murray,[5] co-author of *The Bell Curve*, a book emphasising the needs of the brightest students, also supports TAFE-style education in pointing out that the trades and crafts offer valid alternatives from which students can choose on the basis of how they want to lead their lives. He suggests that the choice of TAFE should not reflect intelligence but lifestyle choices.

Dr Peter Kell of the University of Wollongong has completed an inquiry into TAFE that shows we are falling below the benchmarks in

vocational education as much as in university measures. He also cites the need for TAFE to be a first choice for students. The choice of TAFE, however, needs to reward the student with a well-resourced and well-staffed tertiary education experience that will equip him or her with the skills and general education that will make our workers a competitive force in the global marketplace.

School achievement and equity

Professor Barry McGaw (in chapter 4) uses the OECD PISA test scores to demonstrate clearly that there is serious inequity in Australian education. Socioeconomic status strongly influences educational results. The wealthier an Australian family is, the more likely it is that the children will finish school and be awarded a higher university entrance score. This fact distinguishes us from the really high-performing countries such as Finland and Korea, where socioeconomic factors do not significantly affect school performance. In these and similar countries, government policy has created school systems in which more children come closer to their academic potential, and whatever differences exist are not based on wealth.

The spread of literacy and numeracy results in the top-performing and most equitable countries is much narrower than ours, indicating that equity in the education system has paid off in raising general literacy levels. These countries are able to earn the productivity bonuses described above. There are of course further bonuses in a population whose citizens are more fulfilled, live at a higher standard and feel more social cohesion.

The local research of Cardak and Ryan[6] at the ANU and Latrobe University substantiate these international benchmarks. They studied students' year 9 numeracy and literacy test scores and subsequent university entrance scores. Considering students with median scores in year 9, high socioeconomic status students had a 66 per cent chance of going to university with an average university admission index of 77. Low socioeconomic status (SES) students were dramatically differentiated, having only a 20 per cent chance of getting to university. They had an average university admission score of 63. Being poor cost these students 14 university entrance points. Not providing these equally intelligent students with equitable access costs the nation greatly in lost productivity, innovation and potential.

Yet a study by Miller and Birch of the University of Western Australia shows that, when poorer students do get to university, at every level of entry score, low SES students earned a 3 per cent better first-year result than did high SES students, including those who attended private schools.[7] Could there be a clearer example of how our failure to ensure equity in education is holding us back economically? This is waste. Wasted prosperity. Wasted potential. Wasted youth. It has to stop.

Since the mid 1990s the Howard government failed to see the importance of human capital to the future of our nation. The Labor government has designed New Direction policies that address these failures and aim to make up the deficiencies in the most effective and efficient way. As Stephen Smith has said, extra resources clearly have to go to primary schools in lower socioeconomic areas, Indigenous education and special needs. An education policy such as that offered by the Howard government's Minister for Education, Julie Bishop, which would merely tinker with education through the last years of schooling, was doomed to make insignificant and expensive improvements.

Early child development

A genuine school education policy should start in kindergarten and operate as a coherent program from kindergarten to year 12.

In fact a healthy pregnancy is the real beginning of success at school. Government cannot guarantee a stable relationship between mother and father, but government can and should guarantee health care for mother and child. Good nutrition and health checks with follow-up action are health policies that must complement education policy.

Maslow's hierarchy reminds us that before learning the three Rs, other more basic needs must be satisfied. After physiological safety—water, food, shelter and protection from the elements—the child needs to be loved and to belong to a community. The research is unequivocal: time spent with parents and family building strong relationships is fundamental to getting the most out of education. Only when these basic needs are supplied is the child physically, psychologically and emotionally secure enough to be ready for school, and not before.

Do Australian families today have the continuing security that is necessary to maximise educational opportunity? We need flexible workplace laws that suit today's economic conditions while providing for flexible working hours, maternity leave, family leave and childcare provisions adequate to support healthy family life and cognitive development of preschoolers. Children in single-parent families headed by a woman are disadvantaged in education by their relative impoverishment. For women, who work disproportionately in the retail, hospitality and childcare sectors, wages are being eroded and gender equity is worsening. Relative poverty and the tensions created in families by the Howard government's Work Choices legislation contributed substantially to the capacity constraint in education.

The importance of early childhood education extends into school life. The more quickly and effectively health or educational problems are addressed, the more benefit the child can derive from good teaching programs. The significant expense of early intervention will be more than repaid through less expense in later remediation. The economic flow-on benefits are obvious.

The necessary early intervention support includes full-time permanent reading and mathematics specialists, nurses and educational counsellors on the staff of every primary school. Every child should be evaluated at the start of school and at appropriate stages during primary school. Once a problem is diagnosed, it should be followed up with whatever health or teaching interventions are required.

Teaching and teachers

Labor policy recognises that every child is entitled to a learning core of skills and knowledge, and will depend on that core for further learning, eventual workplace skills and self-actualisation. These most essential elements of education will form a national curriculum that will bind young Australians together in shared knowledge, understanding, skills and equity. Beyond literacy and numeracy, our program will prepare students in science, mathematics, history and languages other than English for a world of global competition, a world that will expect others to speak to them in Mandarin, Hindi, Arabic or Spanish.

It will also be important to do a better job of helping immigrant students to learn English quickly and effectively—and their parents,

so that they can participate in their children's lives at school, with friends and in the Australian culture, with positive effect on social cohesion.

Before I discuss teachers, I must declare a bias. I am a champion of teachers at all levels from preschool to university. I remember from my own education in Catholic schools many good teachers and the few real stars, like those who I hope are scattered through everyone's school memories. These are the teachers who understood me, who pushed me—who let me dream. The teachers who were my stars might not have been the stars for all other pupils. Each child is part of a different constellation and will need her own star. For this reason, we must value every teacher and create salary systems and public respect, to retain them whatever subject they teach, and encourage the best of our youth to choose teaching as a career highly valued by our nation.

My bias is supported by the research. It shows that quality teachers are the most important single school factor affecting the standard of education. Good teachers influence the willingness of students to remain in school and to continue into tertiary education. Students with low university entry scores often slip into teaching because the entry requirements are low. Some will have other abilities that will make them good classroom practitioners. Usually, however, the intellectual demands of teaching as we move further into the twenty-first century will be met only by teachers of superior ability. We should emulate Finland, Singapore, South Korea and the province of Alberta in Canada. These are acknowledged by Michael Barber,[8] education adviser to Tony Blair and to the Chancellor of New York City schools, to be the four best school systems in the world. All four of these schools systems select their teachers from the top third of university graduates.

We need to encourage the best and brightest into teaching. Australia has excellent teachers, thousands and thousands of them. But the retirement of baby boomers means that we need many more. In addition, to raise our education standard, teachers need to be better prepared than ever before. Those teachers who do not reach our quality requirements deserve professional development to raise their knowledge and skills, or to assist them in identifying more appropriate career paths.

Our society already accepts the principle of paying more to those who carry heavy burdens of responsibility. Think of your own child as you listen to Haim Ginott as he describes his own feeling of tremendous responsibility in the classroom:

> I've come to a frightening conclusion that I am the decisive element in the classroom. It's my personal approach that creates the climate. It's my daily mood that makes the weather. As a teacher I possess tremendous power to make a child's life miserable or joyous. I can be a tool of torture or an instrument of inspiration. I can humiliate or humour, hurt or heal. In all situations, it is my response that decides whether a crisis will be escalated or de-escalated and a child humanised or de-humanised.[9]

Conclusion

Only the countries operating with effective long-term human capital policies will enjoy the fruits of the huge expansion of human knowledge and endeavour that is creating such an exciting future.

We are suffering under conditions of the Howard government's limited policy vision—vision so narrow it could not see the self-imposed capacity constraints, vision so narrow it wasted the opportunity that boom-time prosperity provided. It is time to invest wisely in our most important human capital account, the youth of our nation.

Notes

1 Ross Gittins, 'How the PM pushed his luck—and lost', *Sydney Morning Herald*, 11 August 2007, p. 45.
2 Krueger, Alan B., and Lindahl, Mikael, 'Education for growth: Why and for whom?', *Journal of Economic Literature*, American Economic Association, vol. 39, no. 4, pp. 1101–36, December 2001.
3 Australian Industry Group and Dusseldorp Skills Forum, *It's Crunch Time*, August 2007.
4 Business Council of Australia and Dusseldorp Skills Forum, 'The economic benefit of increased participation in education and training', June 2005.
5 Charles Murray, speaking on ABC Radio National, August 2007.
6 Cardak, Buly A., and Ryan, Chris, 2006, 'Why are high ability individuals from poor backgrounds under-represented at university?', La Trobe University, Discussion Paper No A06.04, June 2006.

7 Birch, E. R., and Miller, P. W., 'Student Outcomes at University in Australia: A Quantile Regression Approach', University of Western Australia, Working Paper No. 05-26, July 2005.

8 Sir Michael Barber, education adviser to former UK Prime Minister Tony Blair, to the Ohio Board of Education and to the New York Schools Chancellor, has a short list of four great school systems: Finland, Singapore, South Korea and Alberta, Canada. Their common feature is that 'they all select their teachers from the top third of their college graduates, whereas the US selects its teachers from the bottom third of graduates'.
See Sam Dillon, 'Imported from Britain: Ideas to improve schools', *New York Times*, 15 August 2007, at: http://www.nytimes.com/2007/08/15/education/15face.html?scp=1&sq=Michael+Barber&st=nyt (accessed 28 October, 2008).

9 Ginott, Haim, *Teacher and Child: A Book for Parents and Teachers*, Macmillan, New York, 1972, p. 15.

Chapter 3

Challenges for early learning

Collette Tayler
Professor of Early Childhood Education and Care, University of Melbourne

'Using a needs perspective, there is a tendency to focus on symptoms of needs, rather than the causes of problems of development, learning and inequality. But children have a right to societal support, in their own right as citizens. Rather than it being a duty or a charity, it should be mandatory for all of us to support young children in their development and learning.'

Collette Tayler, who took up the post of Professor of Early Childhood Education and Care at the University of Melbourne in 2007, conducts local and cross-national studies of the ways in which social, family and educational policies and practices affect early childhood education and care outcomes. Collette's recent publications include *Starting Strong II: Early Childhood Education and Care* for the OECD (2006). This chapter was first presented as a public paper on 23 July 2007.

Introduction

This chapter discusses early childhood education and care in Australia. I begin by indicating the sources of evidence that frame my thinking. Then I discuss why we should consider early childhood education and care important. This cannot be taken for granted. Early childhood education and care is not a mainstream, coordinated, public and universal set of programs. It is a voluntary area, and many people are not familiar with it. Then I will refer to Australian data on early childhood education and care, in the Organisation for Economic Cooperation and Development (OECD) context: a snapshot of funding, access, staff; a look at the quality systems that we have (or don't have); and the challenges we face in this country in providing quality programs, providing access and overcoming persistent social inequalities. These matters also translate into a whole set of issues about preparing early childhood professions.

Sources of evidence

The first source of evidence I draw from is *Starting Strong*, a meta-analysis recently published by the OECD. This is the final report of an OECD thematic review of early childhood education involving 20 countries: Australia, Austria, Belgium (both French and Flemish), Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Korea, Mexico, Netherlands, Norway, Portugal, Sweden, UK and USA.[1] The OECD developed this study because it saw services for young children as a vital component of lifelong learning. In economic terms early childhood is a producer of social, human and identity capital. It sets the foundations for the knowledge and skills, competencies and personal attributes that allow people to contribute to their own wellbeing, their social wellbeing, and that of their country.

These OECD reviews follow a standard process. First, the countries that agree to take part each prepare a background report of national data and evidence in the area under review, in this case early childhood education, based on a set of questions asked by the OECD. Second, an international expert team is selected for each country review, and this team goes into the country concerned to check and validate the data and further investigate the issues. It asks questions and gets in underneath the evidence by talking to the spectrum of

people in childhood education, from the children in centres through to ministers for education. Then a report, a 'country note', is prepared by the rapporteur of the international team. *Starting Strong* is a compilation of different ideas taken from all those country notes prepared for the OECD.

The second source of evidence is the Queensland *Preparing for School Evaluation*,[2] which was prepared by Karen Thorpe and a team that included myself. We looked at 1862 children and their families, their principals, the teachers and their assistants. We evaluated the effects of a new full-time play-based program in 2003–04. We took measures at baseline, at the end of the first year and in the following year. The focus was on establishing success factors and child outcomes that related to social, emotional and cognitive development. In particular we were interested in the value added by the program for children who were deemed to be at risk.

The third source of evidence has been shaped by two other reports. *Setting National Standards and Assuring the Quality of Care* is a cross-jurisdiction review of childcare standards and their implementation, and of the systems for assuring quality in Australia, prepared in 2005–06. The project was set up for the Community Services and Disability Services Ministers' Council (CSDSMC).[3] The most recent report is a national review of databases and programs that could enable Australian cost benefit analyses to be undertaken,[4] thereby generating better economic analyses of the effects of early childhood development programs.

Why OECD countries invest in early learning

Why do OECD countries invest in early learning? There are three clusters of reasons.

The first cluster of reasons is grounded in the education of children as citizens. It is agreed across ministries in different countries that the state has a key role in assisting personal, social and identity formation in young children. The strongest focus on the need to fund and focus on early learning is in the Nordic countries. They consider children are citizens in their own right, with an entitlement to high-quality support from the earliest time. For example in Sweden, from 12–18 months of age children take up a universal right to a place in an early education and care program. Most of these programs are

centre-based and closely connected to the families they serve. France and Belgium have a similar orientation. Now consider the other end of the spectrum, not an OECD example: North Korea. I was in Pyongyang in September 2006 to do some workshops for UNESCO. The North Korean child is the child of the state and is in kindergarten from birth to six years old. There were 850 children per kindergarten in those that I visited, and families do not take part.

The second cluster of reasons is related to economic objectives. Australia fits with this one. Women's labour market participation is important for economic growth. Our childcare programs are designed to assist with the combination of family-work responsibilities. Other neoliberal English language countries, like the UK, have a similar orientation.

The third cluster of reasons for investing in early childhood education is related to social welfare. This includes action against poverty and disadvantage, and measures to address demographic challenges such as fertility and immigration. Such motivations affect the USA and Western European countries.

Figure 3.1 attempts to capture the multidisciplinary orientation of early childhood education and childcare (ECEC). The 'push' of economics in the field must be balanced by the 'pull' of education, if children are to receive effective development and learning experiences in a program that is sensitive to their ages and capacities, interesting to them and able to promote positive learning and development among them all.[5] In figure 3.1 the child and family are at the centre. In the first instances the child and family are the key beneficiaries of investment in these programs. Nevertheless, over time the greater benefit is returned in the form of externalities for community and society. This has been demonstrated by longitudinal studies of early intervention programs. You have to have a long-term view about this investment. If you think of the lines—the axes going out from the centre—as a time trajectory, you can see that the benefit and the return on the investment increases over time.

The immediate economic agenda is the provision of places to take children offstage so their mothers can work effectively. But that is not all that is happening. The education agenda is about the provision of not just childcare per se but also high-quality learning programs. If that is not done, the longitudinal benefits to both individual

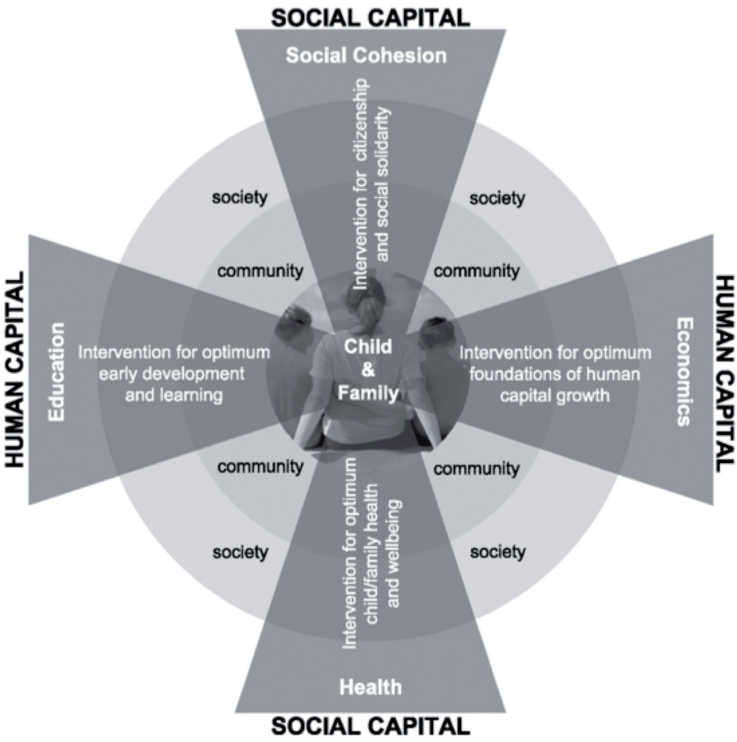

Figure 3.1: Motivations for early childhood education and child care
Source: Tayler et al., *Early Childhood Intervention Programs*.

and society cannot be realised. This means that the final economic equation looks much less advantageous. Programs have to be of high quality if you are to get the gains, the externalities.

Early childhood education and care, translated through relationships and interactions, are the basis for emotional security, for resilience and mental health. Robert Putnam has talked about the importance and the connectedness of well-being, health and education.[6] ECEC directly affects brain development and human potential, and social development. Diversity is a very important part of the relational environment. Local ECEC programs help children's social bonding and social bridging, thereby contributing to community cohesion.

The ECEC environment is a dynamic one in which children create as well as receive their 'environment'. They are active. That is why there is a specialist pedagogy attached to working with young children. Children's early positive experiences are likely to lead to more positive experiences later. But it all turns on the quality of the programs.

Learning occurs most effectively when there is active teaching. This conclusion is strongly suggested by the findings of the Queensland study about the importance of focused interactive teaching.[7] A strong interactive and play-based environment focuses children's learning. In addition, the well-being and experiences of adults (the caregivers and professionals) who interact with young children are also central to the quality of experience of the child.

Consider the growth trajectories in early childhood, as illustrated in figure 3.2.[8] These growth trajectories verify the strong case for ensuring provision of high-quality program and experiences, both in and beyond the home, at this phase of life. On the early childhood education and care patch, the period from conception to age eight, there is considerable activity in the areas of sensing, language and higher cognitive functioning.

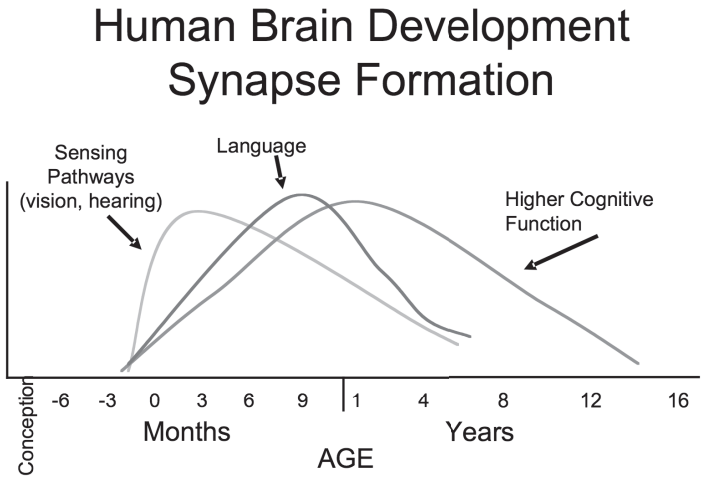

Figure 3.2: Human brain development: synapse formation
Source: National Research Council/Institute of Medicine, *From Neurons to Neighborhoods.*

Is this a critical period of learning? I would say not absolutely 'critical', but it is sensitive. The Romanian adoptee studies led by Sir Michael Rutter, and some other studies that look at children who have had adversity as part of their earliest experience, show that those children can recover. Humans have a great capacity to engage and to improve. But what the studies do seem to show is that the costs of later remediation along these lines are very high. The level at which young children can fully recover from extreme or adverse situations is limited, so that there are opportunities lost as well. This is why ECEC is such an important area.

Australian early childhood education in an international context

Australia is a relatively wealthy OECD country. Our GDP is about $US28,000 per capita. We have one and a half million children who are under the age of six.

Mothers in the workforce

Labour participation by women with children under the age of five is about 50 per cent. This is something that surprises many Australians when they hear it.

At the end of 2005, 16.2 per cent of Australian women with children aged under five years were in full-time employment, and 35 per cent were in part-time employment. That is a low participation rate, given that in most countries workforce participation by women in this category is in the 70–75 per cent range. We can note here also that Australia is one of only two OECD countries that have no automatic paid parental leave. Effectively our system assumes that women will be at home to care for children and that they will pick up a bit of part-time work on the side. That is a huge question mark for Australian social policy.

Child poverty

We also have a relatively high child poverty rate: 14.7 per cent in 2005, compared with an OECD average of 11.2 per cent. I realise that these figures are in dispute and that there are various reported rates. But whichever way you look at it, whichever figures you use, Australia's child poverty rate is of considerable concern.

Funding

Now I will turn to funding. The level of investment shapes the overall ECEC system and defines the structural quality parameters. You can see from figure 3.3 where Australia fits. A mere 0.45 per cent of our GDP is spent on services for children from birth to age six years. Those figures are from the end of 2004. The UK, which looks like it is on the lighter end of spending, decided in 1997 to grow that percentage of GDP. The objective is to reach 1.6 per cent of GDP in the next several years. Figure 3.4 shows two subsets of expenditure: from public sources and private sources.

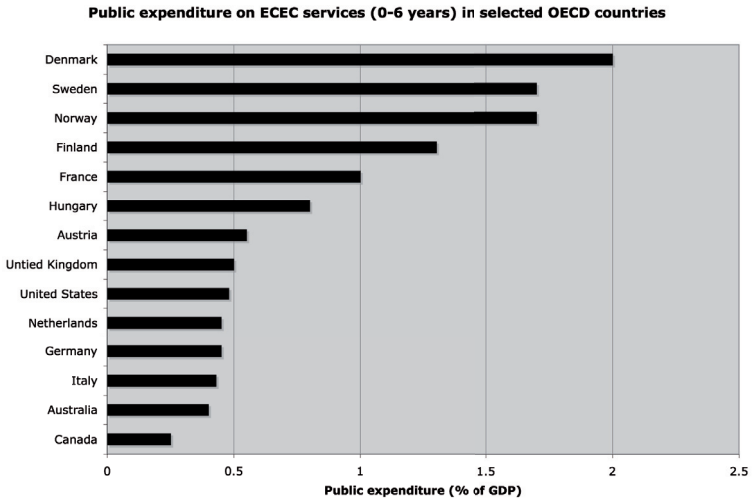

Figure 3.3: Public funding of early childhood education and care in OECD countries

Source: OECD, *Starting Strong.*

Note that if you focus only on investment in 3–4-year-olds and leave out 5–6-year-olds, Australia drops down to only 0.1 per cent of GDP, which is much lower than most other OECD countries. Note also that many of the programs counted into the above figure of 0.45 per cent do not rate as international standard classification education (level 0) programs. The level of qualification of the teachers and the style of program is simply too weak to be included. So Australia is a very poor provider of ECEC.

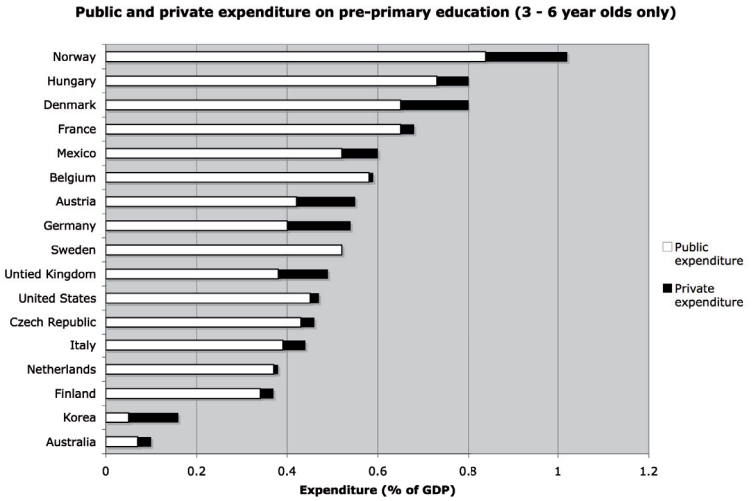

Figure 3.4: Private and public funding of pre-school education in OECD countries

Source: OECD, *Starting Strong.*

How much should Australia invest in early learning? High quality costs money. Looking at full-day programs, in Denmark such a program costs $US19,000 per year. In Finland the program subsidy is 10,250 euros with a parental contribution on top of that. In Norway on the same basis the subsidy is 12,520 euros; in Sweden it is $US12,100. The US Abecedarian program, one of the early intervention programs, was costed in 2002 dollars at $US13,000 per child per year. The US Head Start program has been costed at $8625 for a half-day schedule. Kagan and Rigby find that it costs between $US4000 and $US6000 for a half-day high-quality program and $US8000–12,000 for a high-quality full-day program.[9]

It is very hard to obtain clear-cut Australian data. The Australian Productivity Commission provides some useful 2007 data, however.[10] It has collated various preschool and childcare programs, including out-of-school-hours care. In 2005–06 we spent an average $750 per Australian child on such services as received by children from birth to age 12 years. The $750 is made up of $600 per child from the federal government and $150–200 per child from the states and territories. There has been little change in the expenditure level in real terms

since 2001–02. However, there's a good deal of variation between states where the total ranges from less than $500 per child in Victoria and ACT to more than $800 in the Northern Territory and Queensland. Meanwhile the federal government spent just over $2 billion on all children's services in 2005–06, which again was only slightly more than in 2001–02.

Access

In terms of OECD country levels, in Australia access to ECEC programs is very low. Children become legally entitled to a free program of schooling at the age of 5–6 years. Before that, the OECD data state that we enrol 80.9 per cent of 4–5 year olds. However, the OECD-derived figure drops to 68 per cent if you include programs just before the first year of school and programs that have qualified teachers and a curriculum and an education program focus. This indicates that for a wealthy OECD country we are in a very poor state of ECEC health. Low investment equals low access. Essentially this means that, in many parts of Australia, mothers are meant to take the responsibility themselves, and in most parts of Australia a full-time ECEC service with qualified teaching staff cannot be accessed except at high private cost. This shuns the scientific evidence about the value of ECEC.

Staff

In 2004 the OECD surveyed contact staff working in early childhood programs to find out how many of those who worked every day were qualified. The results may surprise some people. Overall 51.3 per cent of all contact staff did not hold the required base-level qualification—43 per cent of staff in preschools (excluding Tasmania, which did not take part in the survey), 45 per cent in long day care and 74 per cent in family day care were reported as unqualified.

Kindergarten and preschool regulatory environments are hugely varied. Preschools assume a variety of program names around Australia. Not all jurisdictions offer state-run teaching-based preschools. Some preschools follow the public kindergarten pathway of monitoring, registration, reviews, a curriculum, professional development for staff, and supervision. Others follow the childcare pathway with licensed services and annual health checks. They do not have to take part in the Quality Assurance System for National Accreditation.

If services cannot find trained staff they simply hire others. This again brings us to the quality issue. The structural quality of early childhood programs is shaped by staff qualifications, the staff:child ratio and group size. And quality is a very mixed bag.

The challenges

This then is our great task: how to bring to bear the growing base of neuroscience evidence on the importance of early learning and the economic evidence from longitudinal studies on the rate of return to investment in early learning; on the under-provision and poor provision of early learning. How do we overcome the lag in policy action? There is a broad rhetorical commitment to early learning, from the Council of Australian Governments (COAG) down through all sectors. However, the Australian system-base turns on private (parental) responsibility more than on common or state responsibility, and it is about the maintenance of two distinct sectors: childcare and preschool. If the parent does not have the means and commitment to provide a particular program, the child misses out.

The data in Cunha and colleagues' *Interpreting the Evidence on Life Cycle Skill Formation* reinforce the point that returns to investment are highest at the preschool period (see figure 3.5).[11] Many

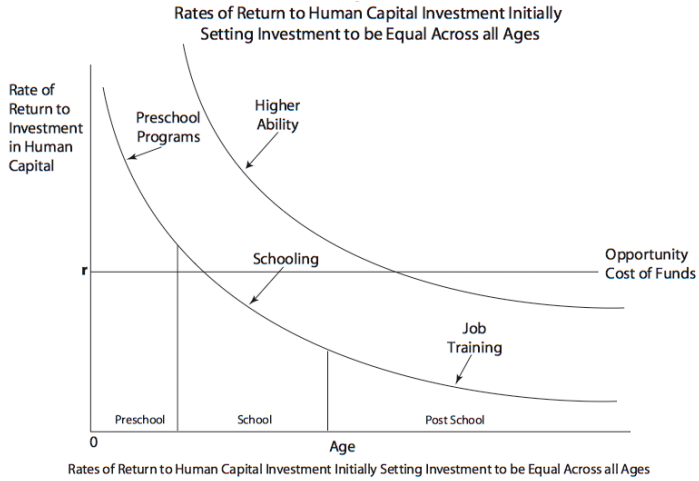

Figure 3.5: Investment in lifecycle formation

Source: Cunha et al., *Interpreting the Evidence on Life Cycle Skill Formation.*

economists and bankers have come out strongly on the side of early childhood. Because of that evidence there have been massive changes towards universal pre-kindergarten programs and universal children's services in many nations. This evidence has transformed some investments in America. Not yet in Australia.

Figure 3.6 illustrates key findings from Leon Feinstein's work.[12] The implication of the graph is that once you establish the baselines of children in high socioeconomic and low socioeconomic circumstances at 22 months, you can predict where the trajectories will go. But with good early learning programs, we can change this graph.

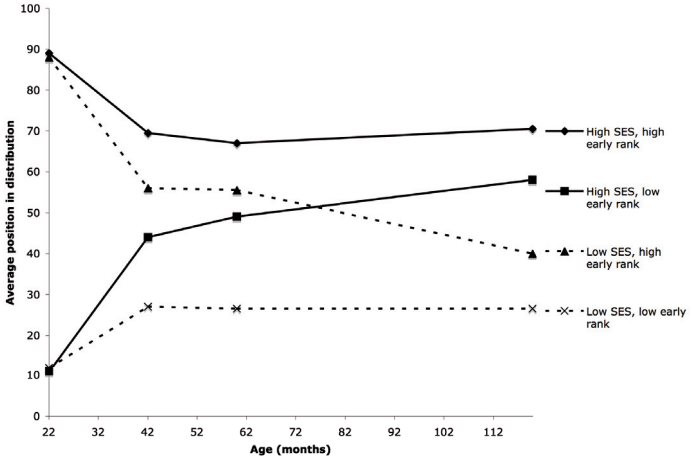

Figure 3.6: How socioeconomic origins tend to shape educational outcomes in the absence of policy intervention

Source: Feinstein, 'Inequality in the early cognitive development of British children in the 1970 cohort'.

In summary, let us consider the policy challenges before us, one by one.

First, we need to raise the quality of the early childhood phase. That means investment in staff, the development of staff training, setting professional development requirements, looking at qualifications compliance, perhaps making some savings through multiple small-scale investments in curriculum development.

Second, although we do not yet have the trained people we need even at the present level of provision, we must address the problem of

social access. Poor access creates social inequality. The main cost is borne by the children who miss out. But access is a quantity issue. There's always a tension between providing quality services and providing sufficient quantity of service to give everybody access. For example South Korea expanded early childhood programs massively in the early 2000s. It had focused on quantity and let the quality side drift. Since then it has realised how important quality is, and has trebled its investment.

Thus, third, we have to deal with funding. UNESCO's *Global Monitoring Report*, which came out in October 2006, showed that there have been mass investments in countries poorer than Australia, such as Mexico and Chile.[13] Australians talk about how many billions of dollars we spend, not what percentage of GDP that spending represents, or the level of access for children.

Fourth, we know little in Australia about which ECEC programs perform well and which programs do not. We need a much stronger focus on scientific evaluations.

Fifth, we need to build a solid cohort of early childhood specialists. We need to become much more searching about why the early childhood profession is still wedded to old ideas, such as the idea that play is 'sacred'. Play is very important. But it doesn't mean you stand back and do nothing except put out a few things for children to play with, expecting that children will just 'develop'. Old ideas like 'we don't intrude on children because we're trying to preserve their childhood' are holding early childhood education back.

It is a myth that a focus on learning and teaching is bad for very young children. It is a myth that has to be exploded. Play-learning needs rethinking and rediscussion, not only in the profession but also among parents. Parents are usually not happy to pay for a program that involves children just playing. They do not see it as adding value. The early childhood professionals we need are people with a very clear scientific base, people with the pedagogical expertise to support children's learning in play-based environments, teachers who are not afraid to say that they teach and that they support learning. They also need skills for their role as family support specialists, which is the other side of their work and one that is critically important.

It is also a myth that intervention is only for children in crises. That myth particularly costs mothers. Mothers who cannot achieve a

work–life balance, who cannot take part in the labour market and be acknowledged for their dual role, are being subjected to long-term limitations. One of the points we made in the *Starting Strong* report was that, if women are a long time out of the labour market, they tend to become deskilled. Further, when they lose connection with the labour market they are unable to build funds for their own long-term support, a key issue for an ageing society.

Finally, there is the challenge of establishing public responsibility for early learning. We must start to think about it not as a private responsibility. ECEC should empower all children, not just children whose parents have the will and the means to support them to get the best out of the system, whether they use private services or semi-accessible public services. We have to make sure that ECEC has program support that is truly public because of its universal character. The externalities, the benefits to society, are well demonstrated. Early learning is worth the investment, especially as it ensures access for children who otherwise would not receive programs.

Conclusion

Figure 3.7 distinguishes between a needs-based and a rights-based approach to thinking about these problems. Depending on which approach you take, you end up with different kinds of services.

Many of our social programs adopt a needs-based approach. Under the needs perspective, ECEC programs are a charity. The area is voluntary. Parents volunteer to take part. Those parents who have the information tend to take a much more active part, and their children are better supported. Also, a needs-based approach is usually narrowly targeted. We know from the Canadian research that, while the largest percentage of vulnerable children might be in the lower socioeconomic group that is most often targeted by policy, the largest number of children who are vulnerable are in middle-income areas because of sheer population numbers. When policy is based on targeting, children in the middle groups tend to miss out. The idea that children 'deserve help' brings opportunities for a rise in social exclusion. The orientation can culturally and socially stigmatise services. It even gives people incentive to remain in a dependent position in the lowest socioeconomic category.

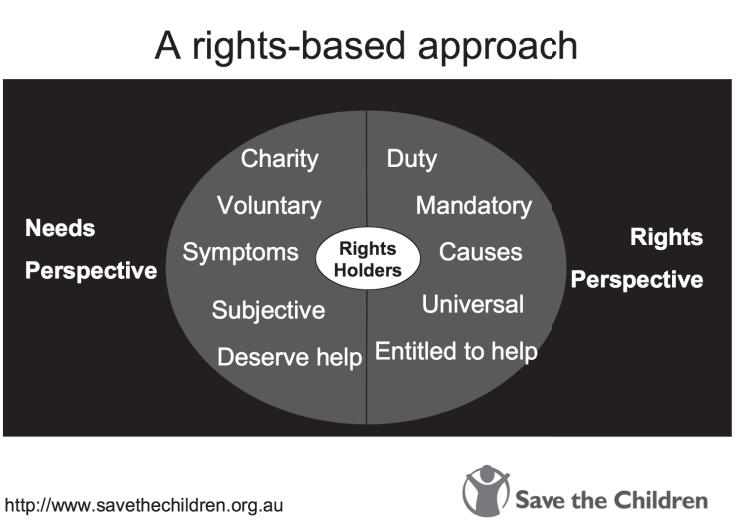

Figure 3.7: Needs-based approach versus rights-based approach to service provision

Using a needs perspective, there is a tendency to focus on symptoms (of needs) rather than the causes of problems of development, learning and inequality. But children have a right to societal support, in their own right as citizens. Rather than it being a duty or a charity, it should be mandatory for all of us to support young children in their development and learning. We must start thinking about this from a holistic universal point of view.

Establishing effective early childhood care and education is a challenge to policy and government. It is a new area of policy for most. The benefits are long-reach. It requires a new approach. At the governmental level, the short-term normally rules. Let us make early learning and children's services the exception!

Notes

1 OECD, *Starting Strong II: Early Childhood Education and Care*, OECD, Paris, 2006.

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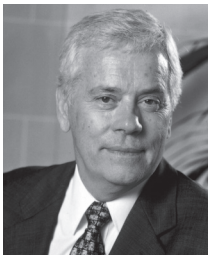
12 Feinstein, L., 'Inequality in the early cognitive development of British children in the 1970 cohort', *Economica*, 70, 2003, pp. 73–97. For a full set of Feinstein's research see the Social Science Research network paper download service, at http://search.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=340982 (accessed 30 May 2008).
13 UNESCO, *Global Monitoring Report: Education for All*, UNESCO, Paris, 2008. Available at http://portal.unesco.org/education/en/ev.php-URL_ID=43283&URL_DO=DO_TOPIC&URL_SECTION=201.html (accessed 29 May 2008).

Chapter 4

How good is Australian school education?



Professor Barry McGaw
Director of the Melbourne Education Research Institute, University of Melbourne

'There is no crisis in the quality of Australian school education, despite the way in which a confected crisis is used to create or support political debate about education in Australia … But there is room for improvement, if we set ourselves the goal of being number 1. There are problems of equity, less to do with our poorer performers being left too far behind than with level of influence on school achievement of differences in students' social backgrounds. We should aim to be high equity as well as high quality.'

Barry McGaw is Professor of Education at the University of Melbourne, Director of the Melbourne Education Research Institute and a consultant with McGaw Group. From 1998 to 2005 he served at the OECD as Deputy Director for Education in the Directorate for Education, Employment, Labor and Social Affairs, then as the first OECD Director for Education. While at OECD he helped to design and implement the Programme for International Student Assessment (PISA). In January 2008 Barry was appointed to head the Australian Government's national curriculum review. This chapter was first presented as a paper on 23 July 2007 and revised in early 2008 to incorporate the most recent set of PISA data.

Introduction

In this chapter I will provide the answers to three questions. How good is Australian school education? How fair is Australian school education? How could we do (even) better?

To assess Australian school education we could take two approaches. One would be to compare it with the past; the other would be to compare it with education in other countries in the present. Comparisons with the past are very difficult to make if we want to use more than adults' fading memories of their own childhood and, worse, memories that are often filtered through rose-coloured glasses. Such empirical evidence from the past as exists is difficult to interpret. Old curricula and examination papers give some notion of what students were expected to learn but, in the absence of marked student responses to examination papers, we can gain little appreciation of exactly what was required. We would also need good information on the nature of the student cohort.

It is better to use current international comparisons where possible. I will draw data provided by the Organisation for Economic Cooperation and Development (OECD), most particularly its Programme for International Student Assessment (PISA).[1] PISA provides direct, internationally comparable assessments of the achievements of 15-year-olds in school.

How good is school education?

In PISA 2000, students were assessed in reading literacy, mathematics and science, with reading literacy being the main domain and mathematics and science being minor domains. In PISA 2003, mathematics was the main domain and reading and science minor domains together with problem-solving, which was an additional domain. In PISA 2006, the three original domains were assessed, with science being the main domain. PISA assesses students' capacity to use the knowledge and skills they have acquired rather than whether they have learned the specific content of their curricula. Sample items, illustrating the content and form of assessment, are provided on the PISA website. Other international comparisons are provided in *Education at a Glance*, the OECD's annual compilation of international comparisons in education.

Figure 4.1 shows the mean performances of countries in reading literacy in PISA 2000. Reading literacy assessed in PISA is the capacity to use, interpret and reflect on written material. The line in the middle of the box for each country gives the mean performance of 15-year-olds in that country. The size of a box reflects the precision with which a country's mean is estimated. Where the boxes overlap on the vertical dimension, there is no significant difference between the means for the countries.[2]

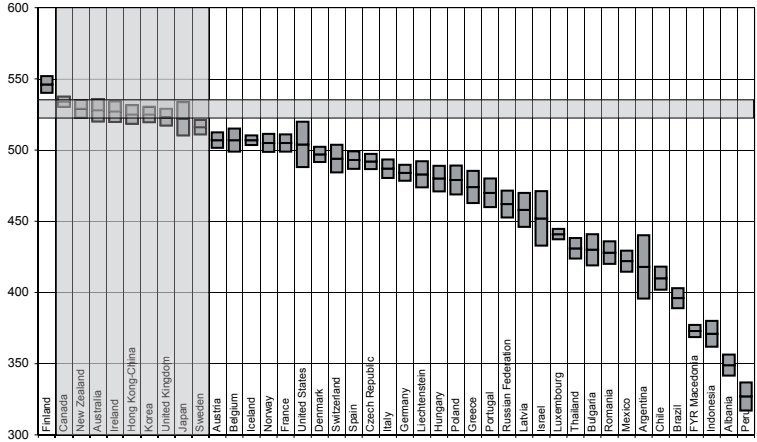


Figure 4.1: Mean reading performances in PISA 2000
Source: OECD, UNESCO, *Literacy Skills for the World of Tomorrow*, p. 76.

The results reveal marked variations in performance levels among the 42 participating countries—ranging from Finland, significantly better than all others at the top, to Peru, significantly worse than all others at the bottom. Australia ranked in fourth place, but its mean was not significantly different from those of two countries above it or six below it. It is therefore appropriate to say that Australia ranked between second and tenth or that Australia tied in second place with eight other countries.

In PISA 2003, Finland was again the only country significantly ahead of Australia in reading. In PISA 2006, however, Finland, Korea, Canada, New Zealand and Hong Kong–China were all significantly ahead of Australia because performances in Korea and Hong

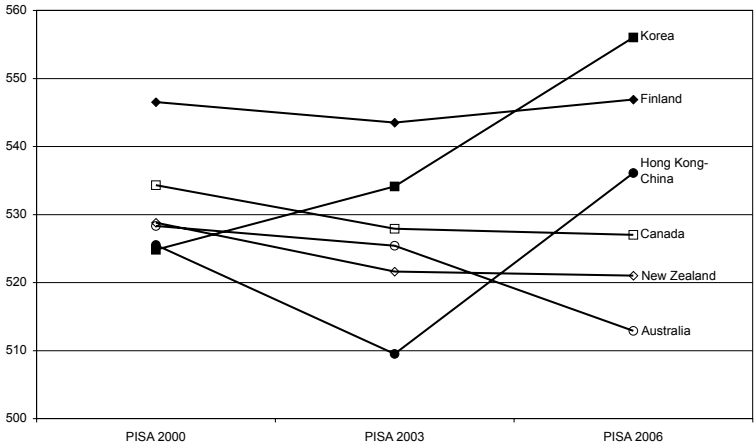


Figure 4.2: Trends in reading performances in PISA

Source: OECD, UNESCO, *Literacy Skills for the World of Tomorrow*, p. 76; OECD, *Learning for Tomorrow's World: First Results from PISA 2003*, p. 281; OECD, *PISA 2006: Science Competencies for Tomorrow's World*, Vol. 1: *Analysis*, pp. 296–7.

Kong–China had improved and those in Finland, Canada and New Zealand had stayed the same whereas Australia's had declined, as shown in figure 4.2.[3]

In PISA 2000, Korea had the narrowest spread of performances in the OECD, with very few students at the lowest level but also relatively few at the highest level. The improved mean performance by PISA 2006 was due to improved performances at the highest levels due, it seems, to a new curriculum with more emphasis on essay tests and expanded use of essays in assessments for university entrance. The decline in Australia's mean performance by PISA 2006 was due to a decline at the higher levels, as shown in figure 4.3.

The performance level at the 95th percentile (the level below which 95 per cent of students perform) declined markedly for Australia, as did those for the 90th and 75th percentiles. At the lower end of the distribution of performances in Australia there was no such decline. The worrying sign for Australia is that, while the mean performance remains high, it has slipped somewhat because our best 15-year-olds are not reading complex text as well as they did just six years earlier or as well as the best 15-year-olds in other high-performing countries.

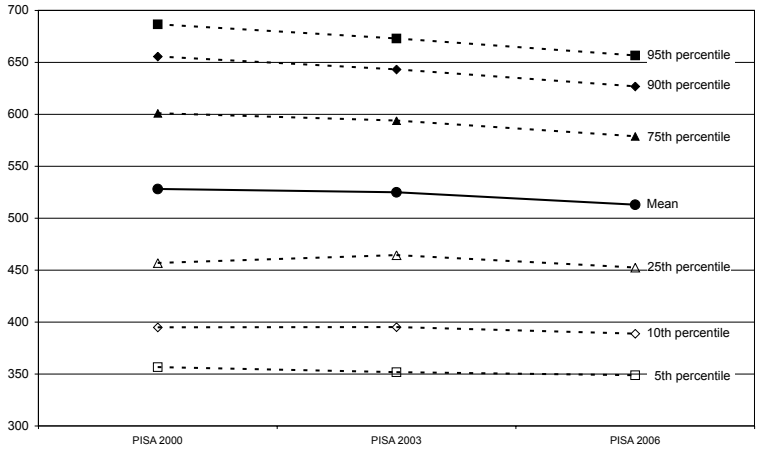


Figure 4.3: Trends in Australia's distribution of reading performances in PISA

Source: OECD, UNESCO, *Literacy Skills for the World of Tomorrow*, p. 76; OECD, *Learning for Tomorrow's World*, p. 281; OECD, *PISA 2006: Science Competencies for Tomorrow's World*, pp. 296–7.

In mathematics, PISA assesses whether 15-year-olds can use the mathematics they have learned in school. It does not focus primarily on the curriculum content to determine whether students have learned exactly what they were intended to learn. Instead, it assesses whether students can recognise that a problem can be solved mathematically and are able to represent it mathematically, then solve it.

In PISA mathematics, Australia is also among the high-performing countries but does not perform quite as well relatively as it does in reading. In PISA 2000, Australia ranked sixth, but only Hong Kong–China and Japan were significantly ahead of Australia so Australia was tied in third place.[4]

In PISA 2003, when mathematics was the main domain of assessment, Australia ranked 11th but tied in fifth place with Finland, Hong Kong–China and the Netherlands being the four significantly ahead. (The Netherlands had not been in PISA 2000.)[5] In PISA 2006, Australia ranked 13th and tied in ninth place. The four countries significantly ahead in 2003 remained so but had been joined by Switzerland and Canada, which had not been different from Australia in 2000 or 2003; Macao–China, which had participated for the first time in 2003 and

had not been different from Australia; and Taiwan, which joined PISA for the first time in 2006.[6]

Actual performance levels, as opposed to rankings, can be compared in mathematics only for PISA 2003 and PISA 2006 since comparable scales were used in those two assessments. Australia's actual mean performance level did not change, but its rank slipped somewhat because the 'opposition' is not standing still. An examination of the full distribution of Australian performances shows that the higher performers were not doing as well in 2006 as in 2003 but that the lower performers were doing somewhat better in 2006 than 2003, the net effect being to keep the mean stable.

In science, PISA assesses whether students can recognise a scientific question, know what counts as evidence to deal with such a question and can marshal such evidence to deal with a question.

In PISA 2000, Australia ranked eighth but tied in third place significantly behind only Japan and Korea.[7] In PISA 2003, Australia ranked sixth but tied in fourth place, this time significantly behind Finland, Japan and Korea.[8] In PISA 2006, when science was the main domain of assessment, Australia ranked eighth but tied again in fourth place, this time significantly behind Finland, Hong Kong–China and Canada.[9] The science scale in PISA 2006 is not directly comparable with those used in 2000 and 2003 when science as a minor domain so it is not possible to compare actual levels of achievement over time. That possibility will emerge for science from PISA 2009 on as it already has for reading and mathematics.

In PISA 2003, problem-solving was assessed as an additional minor domain. Three types of problem-solving were assessed: decision-making (choosing among alternatives with constraints); system analysis and design (identifying relationships between parts of a system and/or designing a system to express relationships); and trouble-shooting (diagnosing and correcting a faulty or underperforming system or mechanism). Sample items are provided in the OECD's *Problem-solving for Tomorrow's World* and the PISA website.[10] Australia ranked seventh overall but was tied in fifth place, significantly behind only Korea, Hong Kong–China, Finland and Japan.[11]

The picture of the quality of Australian school education revealed by the OECD's PISA results is very positive. There is no quality crisis, despite the way in which a crisis is often manufactured to

create or support political debate about education in Australia. That does not mean, however, that there are no challenges or grounds for concern.

Australia is among the high-performing countries, although not at the very top. Australia is a country that aspires to gold, not silver or bronze, in international sporting competitions, so there is no reason why it should not have similarly high expectations of its schools. The worrying sign from the latest PISA assessments in 2006 is that there has been some decline in the performance levels of Australia's best students. The poorer-performing Australian students have not declined in reading and have actually improved a little in mathematics. To drive up the mean performance, Australia needs to improve its performance levels throughout the full performance range but particularly among higher performers.

How fair is Australian school education?

In judging the performance of our education system, we should consider not only the quality of our students' performances but also their equity. This is a country that declares that one of its core values is a commitment to a 'fair go'.

Judging fairness by spread of performance

One simple way to address the issue of equity is to examine the spread of results in different countries. Results will always be spread because of individual differences, but international comparisons can reveal questionable characteristics of the spread in particular countries.

In the main domains of assessment in PISA, there is sufficient information to establish and describe well-defined levels of performance on the relevant scale. In PISA 2000, five levels of performance were defined on the reading scale, with an additional lower domain not being well measured and described only as 'below Level 1'. Students at this level may be literate in the sense of being able to decode printed words and to read text, but they do not have a level of literacy sufficient for further study and learning. Even those at Level 1 are highly likely to be deficient in this respect.

Figure 4.4 shows the percentage of students at each reading proficiency level in each country in PISA 2000. Countries are arranged in order of their mean performance with the percentages of students

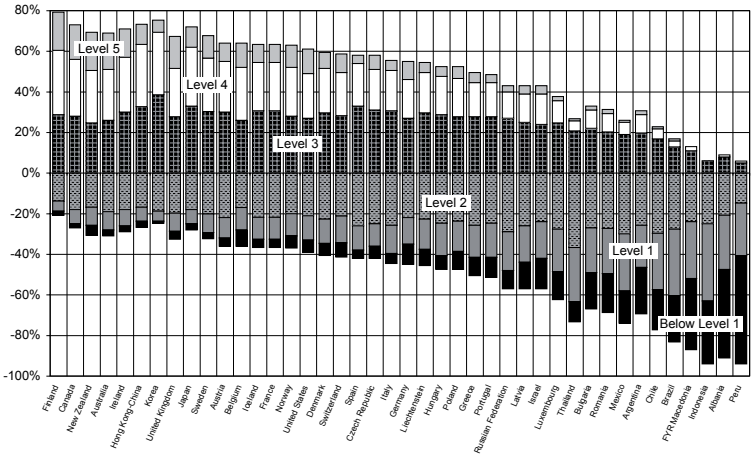


Figure 4.4: Percentage of students at each reading proficiency level in PISA 2000
Source: OECD, UNESCO, *Literacy Skills for the World of Tomorrow*, p. 274.

at Levels 3, 4 and 5 shown above the horizontal zero line and the percentages at lower levels shown below it.

Australia stands out in one important respect. Compared with other high-performing countries around it (Ireland, Hong Kong–China, Korea, Japan and Sweden), Australia has a considerably higher percentage of students at the highest level (Level 5), a considerably smaller percentage in the middle at Level 3 and a somewhat larger percentage at the lowest levels. Australia is leaving its poorer performing students further behind in reading than do these other high-performing countries. New Zealand is rather like Australia but has an even higher percentage of students at Level 1 and below Level 1. Korea provides an interesting contrast. It had a considerably smaller proportion of high achievers but a correspondingly small proportion of very low achievers. The marked rise in Korea's mean reading performance by 2006, as noted earlier, has been achieved by increasing the percentage of high performers.

Similar analyses of performance in mathematics in PISA 2003[12] and science in PISA 2006[13] show Australia's distribution across proficiency levels to be similar to those in other high-performing countries. The message of there being no quality problem in Australian schooling can be nuanced by the additional observation that, in

reading (which is a fundamental skill on which most other learning depends), there are relatively more poor performers in Australia than in other countries where, as in Australia, 15-year-olds perform at a high average level. In mathematics the proportion of low performers is in line with other high-performing countries.

Judging fairness by impact of students' social backgrounds and their performances

A second way in which to examine equity is to investigate the relationship between students' educational performance and their social background.

The 15-year-olds in PISA provide information on their economic and social background—parents' education and occupation, cultural artefacts in the home—that permits the construction of an index of social background ranging from socially disadvantaged to socially advantaged. This scale is comparable between countries. The relationship between social background and performance can be summarised with two indicators: the slope of the regression line, or social gradient, and the correlation coefficient. The social gradient indicates how large an increase in reading literacy, on average, is associated with a particular increase in social advantage. A steep line indicates inequitable results. For the OECD as a whole, the social gradient is fairly steep. The correlation coefficient indicates how well the regression line summarises the distribution of individual scores on both measures. A large coefficient indicates that the relationship is strong and that the regression line provides a good summary. A low coefficient indicates that the relationship is weak. For the OECD as a whole, the correlation between social background and reading literacy in PISA 2000 was 0.45, which is quite a strong relationship for variables of this kind in a whole population. It does mean, however, that only 20 per cent of the variation in individual reading literacy throughout the OECD is explained by differences in students' social background, so there are many individual exceptions to the relationship summarised by the regression line—socially advantaged individuals who do not perform well and students from relatively disadvantaged backgrounds who perform well.[14]

This positive relationship between social advantage and educational achievement has been long established in research in many

individual countries, and it can lead to a counsel of despair. If the relationship between social background and educational achievement is strong, education can seem to be impotent, unable to make a difference. Other research evidence provides assurance that schools can make a difference to the life chances of their students, but the PISA do also if the relationships in different countries are compared.

The social gradients for reading literacy in PISA 2000 in four countries are shown in figure 4.5. The lines for Finland and Canada are significantly less steep than the one for the OECD as a whole, indicating that increased social advantage in these countries is associated with less increase in educational achievement than in the OECD as a whole. The results in these countries are more equitable than those of the OECD overall.

The lines for Australia and Germany are both significantly steeper than the one for the OECD as a whole, indicating that increased social advantage in these countries is associated with a greater increase in educational achievement than in the OECD as a whole. Their results are more inequitable than those of the OECD as a whole.

The differences between these four lines at the left-hand end are substantial. Socially disadvantaged students do very much worse in some countries than others. The gap in educational achievement

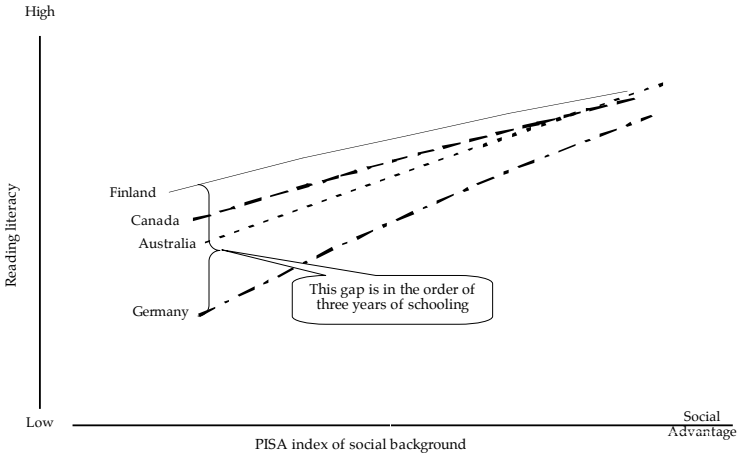


Figure 4.5: Social gradients in four countries for reading literacy in PISA 2000
Source: OECD, *Knowledge and Skills for Life*, p. 308.

between similarly socially disadvantaged students in Germany and Finland represents around three years of schooling. Similarly disadvantaged students in Australia fall about half-way between, around one and a half years behind their counterparts in Finland.

More detailed analysis of the German data shows the pattern to be strongly related to the organisation of schooling. From age 11, students are separated into vocational and academic schools of various types on the basis of the educational future judged to be most appropriate for them. Students from socially disadvantaged backgrounds generally end up in low-status vocational schools and achieve poor educational results. Students from socially advantaged backgrounds are directed to high-status academic schools where they achieve high-quality results. The schooling system largely reproduces the existing social arrangements, conferring privilege where it already exists and denying it where it does not.

If lines for more countries were added to figure 4.5, the pattern would become difficult to discern. A clearer picture for all OECD countries is provided in figure 4.6. Mean performances of countries in reading literacy in PISA 2000 are represented on the vertical axis. The slope of the regression line for social background on reading literacy

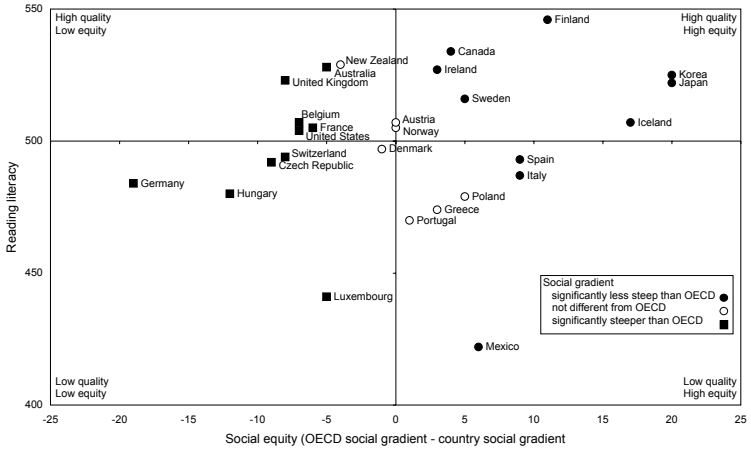


Figure 4.6: Relationship between social gradients and mean reading literacy in PISA 2000 for OECD countries

Source: OECD, *Knowledge and Skills for Life*, p. 308.

is represented on the horizontal axis as the difference between the slope for the OECD as a whole and a country's own slope. This places to the left countries for which the slope is steeper than in the OECD as a whole (countries in which differences in social background are associated with bigger differences in educational achievement) and to the right countries for which the slope is less steep than that for the OECD as a whole (countries in which differences in social background are associated with smaller differences in educational achievement).

Countries high in the figure are high quality and those to the far right are high equity. The graph is divided into four quadrants on the basis of the OECD average on the two measures. The presence of countries in the 'high-quality, high-equity' quadrant (top right) demonstrates that there is no necessary trade-off between quality and equity. They show that it is possible to achieve both together. Korea, Japan, Finland and Canada are among them.

As already indicated in figure 4.5, Australia is a 'high-quality, low-equity' country, with a high average performance but a relatively steep regression line. It is in the top-left quadrant along with the United Kingdom and New Zealand. The United States is only average quality, but it is low equity. Germany, as a low-quality, low-equity country, is in the bottom-left quadrant along with a number of other countries that also begin to separate students into schools of different types as early as age 11 or 12.

In mathematics in PISA 2003, Australia's mean performance again located it as high quality. Its social gradient was not significantly different from that for the OECD as a whole, so it was average equity.[15] In science in PISA 2006, Australia was high quality and, in terms of its social gradient, low equity.[16]

There are many countries to the left of Australia in the graphs like those in figure 4.6 (with less equitable results) but the ones on which Australia should focus are those at or above Australia's quality level and more equitable than Australia. Finland and Canada are always in this category and, in some cases, Korea and Japan.

Using the other indicator of equity of individual results—the correlation between social background and reading literacy in PISA 2000—the picture for OECD countries is given in figure 4.7. On this indicator, Australia is high quality and average equity among OECD countries. Canada, Finland, Korea and Japan again stand out as

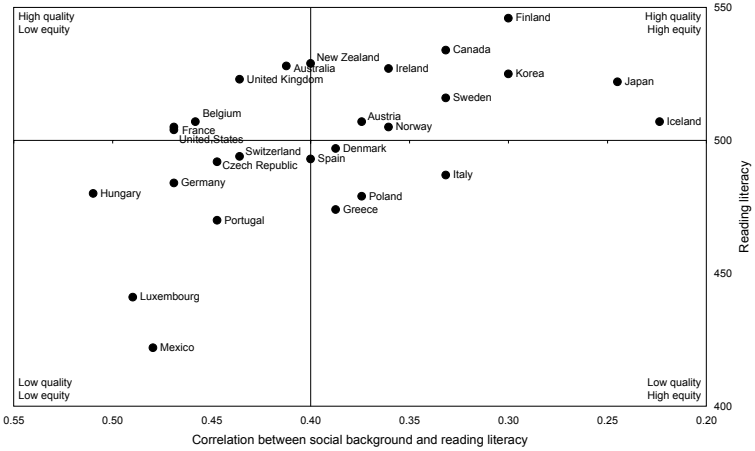


Figure 4.7: Relationship between correlation between social background and reading literacy and mean reading literacy in PISA 2000
Source: OECD, *Knowledge and Skills for Life*, p. 308.

countries that are high quality and high equity, which Australia should aspire at least to match.

In mathematics in PISA 2003, Australia was high quality and low equity using the correlation between social background and performance in mathematics as the indicator of equity, and close to Finland, Canada and Japan in equity.[17] In science in PISA 2006, Australia was also high quality and high equity, using the correlation between social background and performance in science as the indicator of equity. In this case, however, it was still less equitable than Finland, Canada, Japan and Korea.[18]

Judging fairness by impact of students' social backgrounds on school differences

A third way to examine equity is to examine the extent to which differences between schools in students' performances can be accounted for in terms of differences between schools in the social backgrounds of their students.

In figure 4.8, the variation in student performance in reading in PISA 2000 for each country is divided into a component due to differences among students within schools above the zero line and a component due to differences between schools below that line.

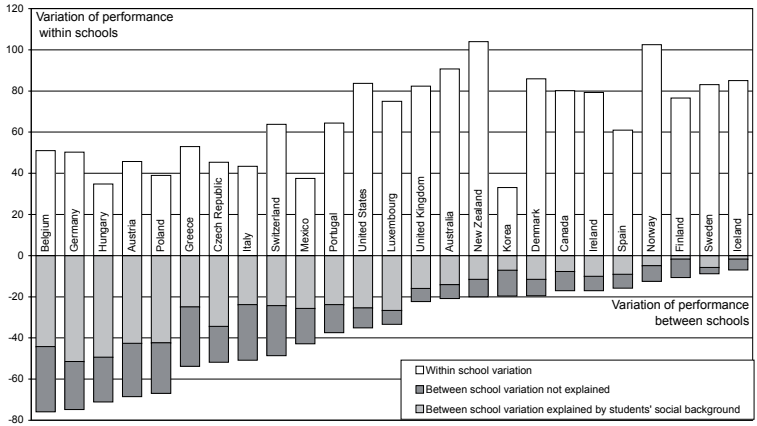


Figure 4.8: Sources of variation in student performance in reading literacy in PISA 2000

Source: OECD, UNESCO, *Literacy Skills for the World of Tomorrow*, p. 357.

In Iceland, Sweden, Finland and Norway there is very little variation in scores between schools. In those countries, choice of school is not important because there is so little difference among schools. Among countries in which there is a large component of variation between schools, there are some in which this occurs by design. In Belgium, Germany and Hungary, students are sorted into schools of different types according to their school performance as early as age 12. The intention is to group similar students within schools differentiated by the extent of academic or vocational emphasis in their curriculum. This is intended to minimise variation within schools in order to provide the curricula considered most appropriate for the differentiated student groups. It has the consequence of maximising the variation between schools. In some other countries, the grouping of students is less deliberate but, nevertheless, results in substantial between-school variation. In the United States, for example, 30 per cent of the overall variation is between schools; in Korea it is 37 per cent and in Australia it is 19 per cent.

For Poland, in PISA 2000, 63 per cent of the variation in reading was between schools whereas in PISA 2003 in mathematics only 13 per cent was between schools.[19] This remarkable difference was

due to a reform in which early streaming of students into schools of different types was abandoned in favour of comprehensive schools for students up to the age at which PISA measures their performance. (Not only was the between-school variation reduced but also Poland was the only country to improve its average performance significantly on all measures used in both PISA 2000 and PISA 2003. It did so largely by raising the achievement levels of its poorer performing students. It continued this improvement in PISA 2006 in which, in reading literacy, its mean was at the same level as Australia's.)

Figure 4.8 also shows the extent to which the variation between schools can be explained in terms of differences in the social backgrounds of the students. The between-school variation is subdivided into variation that can be accounted for in terms of social backgrounds of the students in the schools and variation that cannot be accounted for in terms of the social backgrounds of the students.

In Australia, 68 per cent of the variation between schools can be accounted for in terms of differences between schools in the social background of their students. Among OECD countries, the percentage is higher in only Luxembourg, the United States, the United Kingdom, Hungary and Germany.

In Luxembourg, Hungary and Germany, students are sorted into schools of different types and given different subsequent expectations on the basis of their educational achievement from around the age of 12, but that sorting also involves separation on the basis of social background, as indicated by the fact that the percentage of variation in performance between schools that can be accounted for in terms of differences in students' social backgrounds is 80 per cent in Luxembourg and 69 per cent in Hungary and Germany.

The United States at 73 per cent and the United Kingdom at 71 per cent are like Australia, with no formal sorting of students into schools of different types but rather with a disposition of school types that produces the same consequence. In the United States, school differences reflect community differences. In the United Kingdom and Australia, they reflect community differences and the availability of a large number of private providers that sort students in part on parents' financial capacity to pay the fees required.

In mathematics performance in PISA 2003, 70 per cent of the variation between Australian schools can be explained in terms of

differences between schools in the social background of their students.[20] In science in PISA 2006, the figure was only 40 per cent.[21]

The final nuance to be added to the quality/equity story in Australian school education is that Australian schools are strongly divided on the basis of the social background of the students they enrol. Little of the differences among schools in the educational performances of their students is a consequence of what the schools do; 70 per cent of it is due to whom they enrol.

We cannot tell to what extent this is a consequence of the public/private divide in Australian schooling since the information on what kind of school the Australian students participating in PISA are enrolled in is suppressed. The Australian sample covers schools of all kinds. The information is available in Australia but not published here and not provided to the OECD. Australia is the only country that withholds this information.

Judging quality and fairness by completion rates for secondary education or equivalent

Another way in which to judge the fairness of Australian education is to consider the completion rates for secondary education or its equivalent.

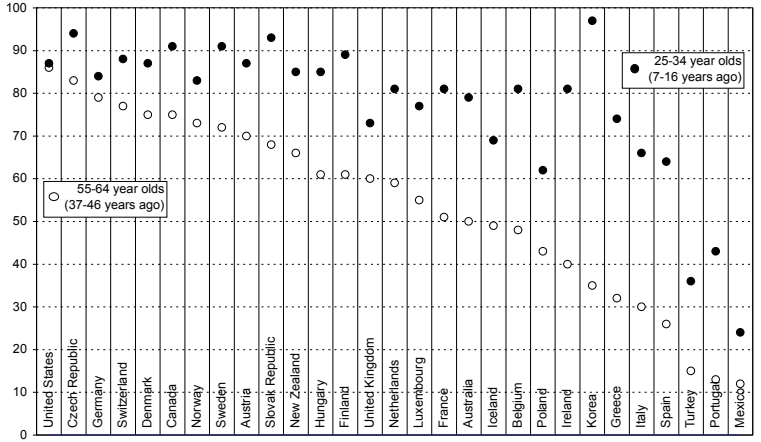


Figure 4.9: Percentage of age groups completing upper secondary education or equivalent

Source: OECD, *Education at a Glance 2007*, p. 37.

There are no internationally comparable data on trends in completion rates for upper secondary education or equivalent, but a picture for past decades can be obtained from the percentages of the population in different age brackets that have attained this level. The percentage of 55- to 64 year-olds who have attained upper secondary education indicates completion rates 37 to 46 years ago. The picture is only approximate because some will have attained this level as adults long after having left initial education and because some of the population will not have survived to this age group. Younger groups provide corresponding pictures for more recent decades.

The attainment rates for 55- to 64-year-olds and 25- to 34-year-olds in OECD countries are shown in figure 4.9. The rates for the younger group show that, by seven to 16 years ago, 18 of the OECD countries had achieved attainment rates of 80 per cent or higher. Australia was not among them.

The Republic of South Korea started from a low base but grew quickly, rising from 23rd with the older group to first with the younger group. The United States started from a high base but grew quite slowly, slipping from first to tenth. Australian rates have grown relatively slowly from a comparatively low base, with the rank slipping marginally from 18th to 19th. Meanwhile Canada rose from sixth to fourth.

In the mid 1960s, South Korea had a GDP per capita equivalent to Afghanistan and behind all countries in Latin America. South Korea is now in the OECD and has a GDP per capita just below the top two-thirds of members. Education reform and a deep national commitment to education and skill development are seen as key drivers of its remarkable economic growth.[22]

By international standards, Australia has high-quality but relatively low-equity schooling compared with other high-quality countries. It also has far too few young people finishing upper secondary education or its equivalent. On this latter measure, Australia is close to the bottom third of OECD countries.

How could Australia do (even) better?

While we can deny that there is a quality crisis in Australian school education, we must admit that there are equity problems. We should, nevertheless, ask how we could do better on both fronts.

Improving quality

First, how could we improve quality? This is a country that is not satisfied by silver or bronze in sporting events because it routinely aspires to gold. We should similarly aspire to be number 1 in education. We should not look to the OECD average and be content with being well above it. We should look for comparison and challenge to Finland, Japan and Korea and, outside the OECD, to Hong Kong–China and Singapore (which, from PISA 2009, will be a participant in PISA).

It is no doubt true that nothing succeeds like success. It is also true that nothing fails like failure. Nothing accumulates like successive failure or early disadvantage. Collette Tayler has shown how important high-quality early childhood education and care are in preparing children for later educational success (see chapter 3). Early identification of poor performance in school and appropriate intervention to build a secure foundation for continuing learning are also important.

Recent OECD work on the extent to which countries provide additional support for students in regular school classes provides an interesting window on early and sustained support within the school years.[23] The data for Finland and the United States are provided in

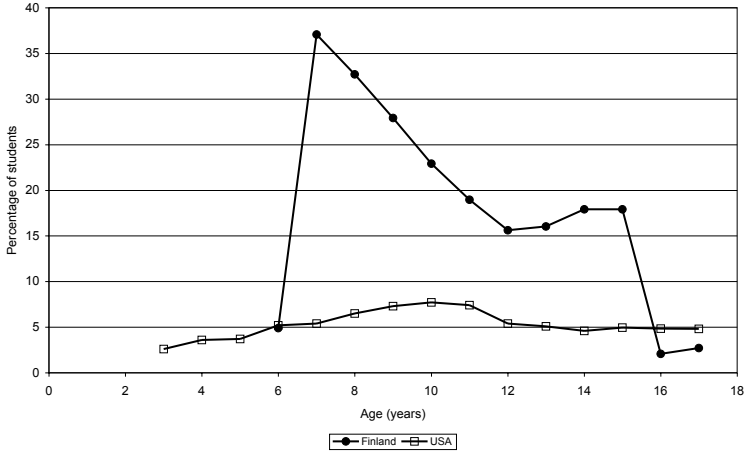


Figure 4.10: Percentage of students receiving additional resources in regular classes

Source: OECD, *Students with Disabilities, Learning Difficulties and Disadvantages.*

figure 4.10. In Finland, children do not commence school until they are seven years of age. Almost immediately, more than 35 per cent of them are identified as needing some additional support. The proportion receiving such support then drops away but remains much higher than in the United States, where the percentage of students receiving additional support is around 5 per cent at age five, then rises during the later primary years. (Australia has not participated in this particular OECD project.)

Teachers are the key to high-quality education, but many OECD countries face problems in the recruitment and retention of high-quality teachers of the kind that they say they desire. Finland is not among them. It is more difficult in Finland to gain entry to a teacher education than to medicine. Teaching in Finland remains a high-status occupation, entered only after six years of masters-level initial education that provides a strong basis in both content and pedagogy.

That is not the case in Australia. One of our difficulties is that we tend to address the supply problem only on the supply side. We reduce HECS charges for teacher education, assuming that cost is the barrier to entry. We should look at the demand side and ask whether the salaries and conditions that we offer teachers are sufficient to attract people of the kind we want to the profession. Australian teachers reach the top of their salary scale in less than ten years. The top is less than one and a half times the starting salary.[24] It is little wonder we have trouble retaining many. Salary is not the only thing that draws people to teaching, of course, but it does send a strong signal about the value that our society attaches to teaching.

Perhaps it is time to pursue a radical solution. One of the reasons that it is difficult to raise the salaries of teachers is that teachers constitute a fairly large labour force. One way to raise their salaries would be to have fewer of them. We could do this if we differentiated the labour force in schools, employing teachers for only those aspects of the work for which professional teaching skills are required and remitting other tasks to a range of other workers. England provides a good example of this development.[25]

We could also differentiate teacher salaries and pay at a higher level to recruit teachers in areas of high demand: mathematics and science teachers, those willing to work in difficult areas. We might gain something at the margin from a performance-based component

of salary, but without addressing salary levels for the profession as a whole we will not get whom we want in the teaching profession and what we want from it. If performance-based pay is to be implemented, then a further caveat should be added. There needs to be a credible basis for assessing performance, and the arrangements should not undercut the teamwork that is essential in schools.

We also need to strengthen the evidence base for effective teaching and to build our teacher education programs more strongly around it. We still suffer from the legacy of teachers colleges that built teacher education as a kind of craft knowledge around 'tips for practice' from effective practitioners. There is a research base of which we should make much greater use and to which we should more actively contribute. Our teacher education should create professionals who expect to have their practices altered during their working lives by new research findings and who are attentive to research findings.

Most of the state departments of education now use student performance data to monitor school performance and to provide stronger reviews and additional support for those teachers and schools that under-perform. We do not generally have such strategies in place for non-government schools even to know which are underperforming, let alone to do something about it. A culture of strong evaluation of current practice is an important element of evidence-based professional practice.

A strong curriculum is important influence on student performance, particularly one that sets high expectations of students. We should look in some detail at what students in the higher performing countries are expected to learn, and we should do this as well for the final years of secondary education—beyond the point at which PISA assessments are gathered.

As we debate the value of a national curriculum there are two issues. One is whether it would be wise to abandon the natural experimentation, and competition, that having eight separate jurisdictions can provide. The other is what form the curriculum should take. Finland's curriculum provides an interesting example. Its national curriculum document has, for each subject area, a statement of objectives (expressed in terms of student skills), lists of core content to be covered (with quite specific entries such as 'angle measurement and classification of angles' and 'study of geometric properties of

two- and three-dimensional figures' in the geometry section of grades 3–5 mathematics) and descriptions of what would amount to good student performance at the end of a period such as grades 3–5. It is a good mix of content and outcomes. It also provides for a good balance between central specification and school responsibility since considerable professional responsibility is left with schools and teachers.

Improving equity

Improving equity will require a focus on low performance, not on disadvantaged social background per se, but we cannot ignore the fact that poor performance is more strongly related to social disadvantage in Australia than in some other high-performing countries. As noted earlier, the information on whether students are in government or non-government schools is suppressed in the Australian PISA data file. There is little other evidence on the basis of which to compare systems in ways that separate the effects of the social background of students and the influence of the school, so we are left not knowing much about the influence of the public/private divide in Australian schooling on student learning. We do, however, know a great deal about differences in funding.

Australian government support for non-government schools was based until 2001 on an estimate of the extent of other resources available to individual schools (determined as their Education Resource Index). On this basis, the government provided fewer funds to schools that charged higher fees, and that provided some incentives for fees to be held down.

Since 2001 the government has based its funding of non-government schools on the socioeconomic status of the communities that the schools are presumed to serve. This is determined on the basis of the socioeconomic characteristics of the people living in the same area as the students enrolled in the school, although this may bear little relationship to the socioeconomic status of the students who actually enrol in a non-government school. Students from wealthier families in relatively deprived areas, such as some country towns, bring with them to a non-government school support from the Australian Government based on the socioeconomic characteristics of those they leave behind.

Furthermore, the level of support for non-government schools is also based on Average Government Schools Recurrent Costs (AGSRC). Government support per student for non-government schools is at a lower rate than this average, but that does not take account of the influence on the average cost in government schools of the cost penalties involved in providing for the full range of students and doing so in small schools in remote locations.

The effect of the change in the basis of Australian government funding for non-government schools from the Education Resources Index to the Socioeconomic Status Model has resulted in remarkable increases in funding, as the data for some of the best resourced schools in Victoria in figure 4.11 show. Australian government funding for these schools has increased in theperiod 2001–07 by between 82 per cent and 503 per cent, although, since the enrolments in the schools have also altered, it is more appropriate to consider the increase in per-student funding. That increase has been between 59 per cent and 305 per cent. Despite the substantial increase in government support, fees have also been raised by between 30 per cent and 54 per cent for year 12 students. A good analysis of the nature and extent of funding by both the federal and state governments for government and non-government schools is provided by Lyndsay Connors.[26]

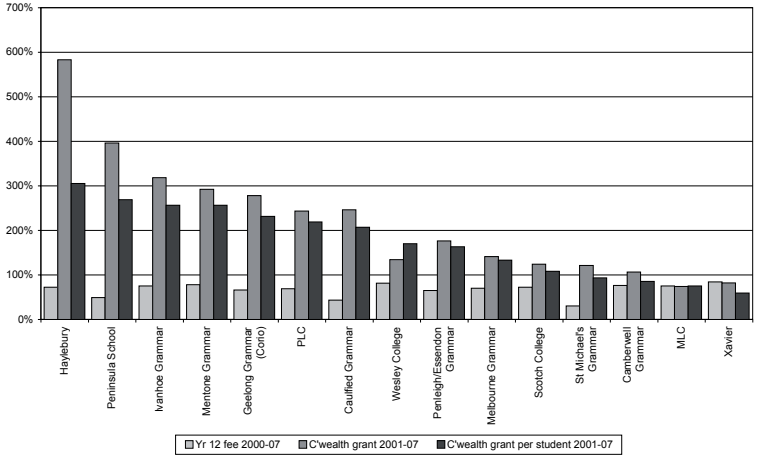


Figure 4.11: Income increases for selected Victorian non-government schools

Source: A. Blair, 'Presentation to WA Secondary School Executives Association Conference', Perth, 2007.

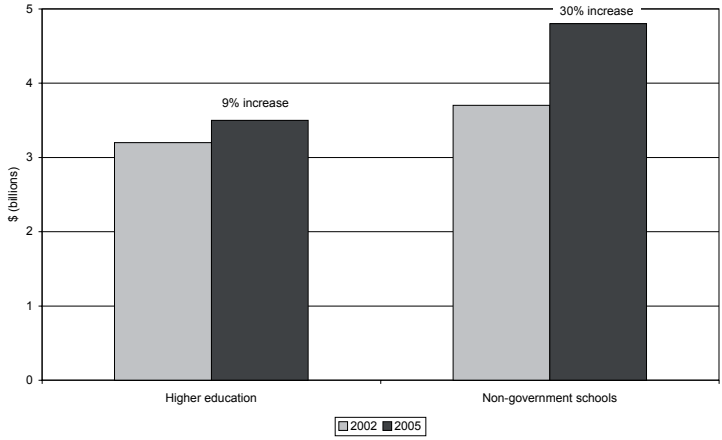


Figure 4.12: Commonwealth funding of higher education and non-government schools

Source: Marginson, chapter 6, this book.

One consequence of the substantial increase in Australian government funds for non-government schools is that the government now provides more funding for non-government schools than it does for universities. This gap has been widening, as figure 4.12 shows. As Lyndsay Connors asks, 'Who voted for the Commonwealth Government to spend more on non-government schools than universities?'

I use the data in figure 4.12 and those in figure 4.11 to argue not for non-government school resource levels to be reduced but for the resource levels of government schools to be substantially raised. This is not the politics of envy. It is the politics of fairness in a country that often loudly proclaims a commitment to a 'fair go' as one of its central values.

It is often claimed that schools are the only agencies that provide common experiences for young people growing up in modern societies that can, in turn, build shared understandings. In fact, schools frequently divide on the basis of gender, faith, social background, wealth, geography and so on. It is schooling, not school, that is the common experience. Diversity offers choice, although choice is by no means available to all, particularly those who have no choice other than an under-funded and poorly resourced local government school.

The Netherlands provides an interesting contrast in funding arrangements to Australia. In the Netherlands, 70 per cent of students attend non-government schools, but all schools are funded by the government at the same level. Non-government schools are not distinguished from government schools by their resources levels since a condition of government funding is that they may not charge fees. In Australia, there are marked differences in resource levels associated with governance models, although that should not obscure the fact that there are poorly resourced non-government schools as well as government ones.

In the Australian context, we should also explore ways in which schools of different kinds might collaborate. Interfaith dialogue among students from Christian, Jewish and Islamic schools is being held in a number of Victorian non-government schools. Co-location of government and non-government schools to facilitate collaboration was pioneered in the 1980s by the South Australian property developer, Delfin. In Golden Grove, three secondary schools on one site have shared use of a library and science and other facilities for more than 15 years and now timetable foreign language teaching at the same time to offer more languages together than any could alone. These arrangements respect the identities of the schools and the differences among them while creating new forms of interaction among their students.

Conclusion

The story on Australian school education is that there is no crisis in quality but there is room for improvement if we set ourselves the goal of being number 1. There are problems of equity, less to do with our poorer performers being left too far behind than with the level of influence on school achievement of differences in students' social backgrounds. We should aim to be high equity as well as high quality.

We also need to increase the completion rate of upper secondary education.

We need to improve the quality of our teaching force by granting them, through higher salaries, the higher status we declare we wish to give them. We should explore ways of achieving this through a radical restructuring of the workforce in schools. We should also ensure that professional practice in teaching is more firmly grounded in a research base that provides evidence on what works.

Finally, we must reduce the resource disparities between schools by raising the resource levels of the most poorly resourced, which are predominantly government schools.

Notes

1 OECD, Programme for International Student Assessment, www.pisa.oecd.org.
2 Further details are given in OECD, UNESCO, *Literacy Skills for the World of Tomorrow: Further Results from PISA 2000*, OECD/UNESCO, Paris, 2003.
3 OECD, UNESCO, *Literacy Skills for the World of Tomorrow*, p. 76; OECD, *Learning for Tomorrow's World: First Results from PISA 2003*, OECD, Paris, 2004, p. 281; OECD, *PISA 2006: Science Competencies for Tomorrow's World*, Vol. 1: *Analysis*, OECD, Paris, 2007, pp. 296–7.
4 OECD, UNESCO, *Learning for Tomorrow's World: First Results from PISA 2003*, OECD/UNESCO, Paris, 2003, p. 100.
5 Ibid., p. 92.
6 OECD, *PISA 2006: Science Competencies for Tomorrow's World*, Vol. 1: *Analysis*, OECD, Paris, 2007, pp. 316–17.
7 OECD, UNESCO, *Learning for Tomorrow's World*, p. 109.
8 Ibid., p. 294.
9 OECD, *PISA 2006: Science Competencies for Tomorrow's World*, pp. 56–7.
10 http://www.pisa.oecd.org.
11 OECD, *Problem-solving for Tomorrow's World: First Measures of Cross-curricular Competencies from PISA 2003*, OECD, Paris, 2004, p. 294.
12 OECD, *Learning for Tomorrow's World*, p. 91.
13 OECD, *PISA 2006: Science Competencies for Tomorrow's World*, p. 49.
14 OECD, *Knowledge and Skills for Life: First Results from the OECD PISA 2000*, OECD, Paris, 2001, p. 308.
15 OECD, *Learning for Tomorrow's World*, p. 397.
16 OECD, *PISA 2006: Science Competencies for Tomorrow's World*, p. 184.
17 OECD, *Learning for Tomorrow's World*, p. 397.
18 OECD, *PISA 2006: Science Competencies for Tomorrow's World*, p. 184.
19 OECD, *Learning for Tomorrow's World*, p. 383.
20 Ibid., p. 383.
21 OECD, *PISA 2006*: *Science Competencies for Tomorrow's World*, vol. 2: *Data*, OECD, Paris, 2007, p. 96.
22 Maddison, A., *The World Economy: A Millennial Perspective*, OECD, Paris, 2001.
23 OECD, *Students with Disabilities, Learning Difficulties and Disadvantages: Policies, Statistics and Indicators—2007 Edition*, Paris, OECD, 2008.
24 OECD, *Education at a Glance 2006*, OECD, Paris, 2006, p. 385.
25 See www.tda.gov.uk.
26 Connors, Lyndsay, 'Too smart by half', 2007, http://cpd.org.au/too-smart-by-half (accessed 22 October 2008).

Chapter 5

The global challenge for universities

Professor Shih Choon Fong
President, National University of Singapore

'Universities in smaller economies like Singapore and Australia can ride the rising Asia-Pacific tide by focusing on niche areas, helping them compete for globally mobile talent and resources, and build up strengths. These areas of strength can build the foundation for strong global bridges with traffic flowing in both directions. Without indigenous areas of strength, a bridge merely functions as a service stop.'

One of the world's leading researchers in engineering, Shih Choon Fong became President and Vice-Chancellor of the National University of Singapore (NUS) in 2000. He is also the Chairman Emeritus of the Association of Pacific Rim Universities, a consortium of 37 institutions in the Asia-Pacific region. Under Choon Fong NUS has sustained an exceptionally dynamic global strategy. This chapter was first presented as a paper on 25 June 2007.

The changing higher education landscape

This chapter is concerned with the changing higher education landscape and its strategic and policy implications. I begin by outlining three tectonic changes, three phenomena transforming our world: shifting centres of gravity; increasing cultural complexity; and rising China and India. The issues at play are not confined to the economy, science and technology. Increasingly, they go to the heart of our human relations and our philosophies of life.

I then discuss the implications of these changes for our university strategies, especially in small to medium economies such as Singapore and Australia, and discuss some examples of the kind of global initiatives that can bear fruit.

Tectonic changes for universities

Shifting centres of gravity

From the eighteenth and up to the early twentieth century, the world tended to be seen from a Eurocentric perspective. For many centuries, this was the map of the world. Europe was at the centre of economic, political and military power. London's Greenwich Meridian even symbolically defined time. Then there was the periphery, with Asia being known as the 'Far East'.

The early twentieth century saw the rise of America. The geopolitical axis shifted, and America became the economic, political and military superpower of the world. I was a graduate student in North America in the 1960s, and the map I often saw in those days showed America in the centre, with Europe to the east and Asia across the Pacific Ocean to the west.

The centre of gravity for knowledge and culture has moved in similar fashion, shifting in tandem with economic power. Asia, including the Middle East, was the seat of knowledge and culture during the days of the Agrarian Society. About 500 years ago, Europe became the centre for knowledge and science, through the Industrial Age, up until the early twentieth century. The advent of the information and innovation revolution in the second half of the twentieth century took the world into the Knowledge Era. In this Post-Industrial age, America developed as the hub for leadership in science and innovation as universities sprung up to anchor the creation and exploitation of knowledge.

In the science- and innovation-driven global economy of the twenty-first century, there is a rich interplay between a country's economic strength and its capacity for development and competitiveness. With Asia being home to the world's two most populous countries, China and India, the centre of gravity for economic strength and leadership in science and innovation could well shift further westwards, towards the Asia Pacific. This will be discussed further below.

Increasing cultural complexity

The second phenomenon is the increasing cultural complexity of the world today. Earlier, I noted the evolution of societies over the millennia, from Agrarian to Industrial to the Knowledge Era. Sociocultural change is measured by generations, if not centuries. During the Axial Age, great thinkers and founders of faith like Plato, Confucius and the Buddha set forth basic values and human ideals, like compassion, empathy and self-cultivation, which have shaped us until today. But this profound transformation took place some 2000 years ago. The evolution of our social and cultural DNA, our empathy, identity and values, occurs slowly.

In contrast, in the Knowledge Era the pace of technological change is measured by years, even by months. If anything, the accelerating pace of technological change has far exceeded the pace of sociocultural evolution. This technology/culture divergence is growing, with far-reaching influence. In recent decades, as advances in science and technology have accelerated, space and time have shrunk. In shrinking the space between cultures and civilisations, technology has shoved us in one another's faces, often making diverse peoples into reluctant neighbours. Without a core of shared values, familiarity may breed contempt instead of respect and admiration. Moreover, the internet has created an instantaneous medium with a global reach. Information can be sent at the click of a mouse; so can disinformation. 'Forward' or 'Reply all' is all too often a reflex action, done with little thought.

The upside of this is that information that creates positive social change can spread overnight. Consider the story of William Wilberforce and his campaign against slavery in the British Empire as told in the film *Amazing Grace*. Had the internet existed then,

Wilberforce could have exposed the atrocities of slavery much quicker to his compatriots, who were blissfully unaware of the source of their sugar.

But where the light of truth may spread, so too may hysteria and the poison of hatred. There is a negative influence when the damping effect previously created by continents and time no longer exists. Like a body of liquid that loses viscosity and becomes volatile, a small perturbation can lead to great turbulence. The internet facilitates making mountains out of molehills, spreading anxiety, anger and hysteria faster than a bush fire. A butterfly flapping its wings at a knighthood in Buckingham Palace leads to hurricanes in Pakistan. Personal vendettas have global effect, and global events can upset personal lives. The point is that the personal can become global, and, oddly enough, the global has become personal.

We are thus witnessing intensified conflicts on a global and personal scale, the clash of cultures, global terror, social turmoil and congestion, in addition to the ever-present competition for limited resources. Ironically, while clashes on a regional scale have been common throughout history, the increasing intensity as well as frequency of global conflicts may in part be attributable to our immense success in harnessing science and innovation.

It is clear that we will need to go beyond science and technology to seek answers. Amidst tectonic changes, universities have a larger role in preparing citizens and societies for a new tomorrow that is driven by science and technology. However, science and technology alone cannot provide the solutions. There are strong ethical and cultural dimensions to many of the world's challenges. The university for the twenty-first century has both a functional mission and a civilising mission. The functional mission is to develop human capital, encompassing both intellectual and sociocultural aspects. The civilising mission relates to character development of the global citizen and the ongoing quest for shared values in a fragmented world.

Rising China and India

Let us consider the third change, rising China and India. By 2050 China, India and the United States are forecast to be the three largest economies. Note that two of them are in Asia. Europe and Japan will

continue to be major players. Emerging Asia will be shaped by the larger economies: Japan, China, India and Korea. I suppose we should also include a little red dot, Singapore. You have to strain your eyes to see the tiny red dot that is Singapore.

With the robust economic growth and huge population base in an emerging Asia, demand for higher education is expected to increase threefold by 2025. Its rising investment in higher education to meet the demand will give Asia a comparative advantage in a talent-based, innovation-driven global economy. At the same time, we are seeing the intensification of trans-Pacific ties and linkages, facilitated by a more balanced talent flow between North America and Asia. It is not surprising, then, that the twenty-first century has been forecast to be the Asia-Pacific century.

What is the consequence for small economies and their universities? How do small players, particularly those in the Asia-Pacific, ride the tide of a rising China and India, and not be caught in the cross-currents? With the rising Asia-Pacific tide, our geographical location seems to be a strategic advantage. The challenge for both Singapore and Australian higher education is how to come to grips with the Asia-Pacific century. Will we ride the tide of a rising China and India? Or will South-East Asia, including Singapore, and Australia become a backwater?

Focus and build global bridges

Universities in smaller economies like Singapore and Australia can ride the rising Asia-Pacific tide by focusing on niche areas, helping them compete for globally mobile talent and resources, and build up strengths. These areas of strength can build the foundation for strong global bridges with traffic flowing in both directions. Without indigenous areas of strength, a bridge merely functions as a service stop.

Global excellence in education and research is likely to be advanced by collaborative endeavour. Bridges, across continents, cultures and disciplines, enable universities to reach higher levels of excellence that require the kind of resources and influence that few institutions can deliver by themselves.

Take for example a multinational corporation, which might be characterised as a global alliance of different business units, each of which is typically the best in class in what it does. In what Thomas

Friedman has referred to as a 'Flat World', best practices gained in one business unit, or country office, spread quickly across the corporation. In contrast, we do not see this in our universities. Our departments and faculties look like silos. Like some medieval fortress, we seem to be instinctively tribal, allied to turf and discipline. While providing stability to our societies, this impermeability mitigates against innovation. For universities, especially in small economies, the flow needs to speed up, and we need to reap the benefits of being more like a highly networked organisation.

I would like to share a few examples from Singapore and the National University of Singapore (NUS) that reflect our efforts to focus on areas of strength, collaborate with partners to build networks, get into the flow and create synergies.

Bridging institutions, bridging disciplines

The first example is our National Research Foundation's Campus for Research Excellence and Technological Enterprise, or CREATE. CREATE will be located on NUS's campus. It is a collaboration of bridging institutions and disciplines that will bring top researchers from some of the world's best universities to work alongside Singapore collaborators in areas that are aligned to Singapore's strategic interests. Locating CREATE within a university setting promises to catalyse the organic growth of a global R&D community in Singapore as well as expand our talent base, home-grown and overseas sourced. The first to set up a research centre within CREATE is the Massachusetts Institute of Technology. Another institution likely to join CREATE is the Swiss Federal Institute of Technology.

Bridging continents, bridging disciplines

Universities in small economies can also bridge continents and disciplines through global university networks. For example, the Association of Pacific Rim Universities (APRU) is an alliance of 37 research-intensive universities on four continents. Melbourne, Sydney, ANU and NUS are members, with Sydney and NUS taking a leadership role. Under the auspices of APRU is the APRU World Institute, or AWI. Professor Glyn Davis of the University of Melbourne is a member of the governing board for AWI. Bringing together top minds to harness the power of science unbounded by disciplinary,

cultural or continental boundaries, AWI seeks to address pressing global challenges such as public health and climate change.

Another global network is the International Alliance of Research Universities (IARU) led by the Australian National University (ANU). Through these global alliances, the whole can be greater than the sum of its parts. The synergies in these partnerships help create greater influence.

Bridging continents, bridging cultures

On the educational front, I will mention two initiatives at NUS: NUS Overseas Colleges, and our residential colleges in Singapore.

For the past six years, NUS third-year undergraduates have had the privilege of being immersed in five of the world's dynamic entrepreneurial hubs: Shanghai, Silicon Valley, Philadelphia, Stockholm and Bangalore. The alumni of this program, NUS Overseas Colleges, now number about 400. While at the overseas colleges our students engage in full-time internships with start-up companies. A good number have started their own companies.

On the home front, we are building an integrated learning and living environment of residential colleges for 6000 students. Forty per cent of the residents will be from abroad. Both our overseas colleges and residential colleges promote peer learning and dialogue across cultures. Through shared experiences, students from diverse disciplines, nationalities and cultures learn the mutual trust and respect so vital for global citizenship. They learn to bridge the divergence between technology and culture.

The path ahead

I have spoken of bridging continents and cultures as a global strategy for universities in small economies to fulfil their functional and civilising missions. These are investments in the future, in which the Asia-Pacific is likely to take centre stage.

Australian universities have much to contribute to this future. My view of Australian society is that it has the drive of an immigrant society and at the same time values the individual. In a knowledge economy, such traits are a good thing, because they enable tall poppies to flourish. These are qualities that Australia could tap to its advantage. However, for Australian universities to ride the Asia-Pacific

tide, Australian society will have to decide whether it wants to be a committed cultural neighbour of Asia. I am sure you know this choice is before you.

The West has contributed immensely in terms of science and technology. While this science has been fundamental in building our current technological civilisation, it has been peripheral in civilising the human heart. This science can crack the human genetic code, but cannot mend a human heart split by hatred. Our technology can regulate the destructive energy of the atom, but we cannot regulate our destructive impulses. We have much knowledge but less wisdom. The promethean flame of science that has lit up our lives sometimes threatens to reduce humanity to cinders as well.

In the headlong rush for functional knowledge, especially science and technology, and for economic gains—perhaps most evident in China, but elsewhere as well—we are now asking our universities to exert a civilising influence: to develop character, not just careers; to build global citizens, not just global workers; and to engage in the difficult quest for shared values, and not just share value.

The imperative to focus and collaborate, to build bridges across the world's many divides, has greater urgency now. To become wise, and not just have knowledge. Focus, collaborate and thrive. If we do it right, we will ride the rising Asia-Pacific tide. If not, we will drown.

Asia was the birthplace of many of the axial wisdom traditions that have guided humanity for more than two millennia. China's apparent disinterest in these traditions notwithstanding, I hope that the rest of us in the Asia-Pacific, Australia included, can help renew and adapt these traditions for the Knowledge Era, thus helping close the technology/culture divergence. An interdisciplinary approach is needed. Scientists and humanists, philosophers and pragmatists need to engage with one another to provide uniquely Asia-Pacific responses to these questions of our times.

The best and brightest in Asia are often drawn towards the sciences and professional schools, often because of national policies, but also because of the personal rewards. This implies that a greater obligation is placed on our science and professional schools: that they must also engage in the broad social, humanistic and philosophical issues of our times.

As the tide rises in the Asia-Pacific, my hope is that the rise goes beyond science and commerce to also embrace culture and the richest aspects of civilisation. I hope that as educational leaders in the Asia-Pacific, we will reclaim our duty in fulfilling this charge, so that we may all thrive in the fullest sense.

Chapter 6

Global setting, national policy and higher education

Simon Marginson
Professor of Higher Education, University of Melbourne

> 'Perhaps we are coming to a watershed time in the higher education sector, when the Australian system is transformed … We have it within us to build an expanded and modernised national system of education, training and public sector research—on the basis of a creative national consensus about the Australian nation and globalisation—and to deploy this modernised system to secure a great advance in national capacity, identity, prosperity, wellness and sustainability.'

Simon Marginson has worked as Professor of Higher Education in the Centre for the Study of Higher Education at the University of Melbourne since 2006. His research and writing are focused on higher education, international education and education policy in the context of globalisation. Simon's books include *Markets in Education* (1997), *The Enterprise University* (with Mark Considine; 2000) and the edited *Prospects of Higher Education* (2007).

Introduction

We might be coming to one of those watershed times in Australian higher education when the system is transformed. Such transformations have occurred three times before. There was the initial building of national university and advanced college sectors between the late 1950s and the mid 1960s. There was the consolidation of mass tertiary education and its funding in the 1970s. In the late 1980s, in the Dawkins reforms,[1] there was the creation of a mixed funded competitive university sector, with half an eye on the outside world, which had been moved closer by financial deregulation and the opening up of the Australian economy.

The last transformation occurred a generation ago. The dynamic of those reforms is exhausted, and the system has run into accumulating problems that have compounded with each other. There are signs that both sides of politics now want to build something different.

We have it within us to create an expanded and modernised national system of education, training and research, on the basis of a creative policy consensus about the Australian nation and globalisation. At best we could deploy this modernised system to secure a great advance in national capacity, identity, prosperity, wellness and sustainability. It has been done before.

From the late 1950s to the late 1970s, during the first two system transformations, public policy-makers and educationists built in Australia a world-class national higher education and research sector. Student numbers grew by eight times. Doctoral research was established in most fields of study. A start was made on the modernisation of vocational training. The process was led by successive commissions, reports and programs, grounded in a national consensus on investment in knowledge, in which ideas of human capital were central,[2] and a consensus on governance in which tertiary education was imagined as a semi-autonomous part of the public service. The national policy consensus lasted just two decades. But the Australian economy is in the world top 15 today in part because of the national consensus on investment in knowledge and system-building from the late 1950s to the 1970s.

This chapter argues for the renewal of this national mentality in the age of the global knowledge economy, grounded in somewhat different understandings and mechanisms from those of the 1950s,

1960s and 1970s—especially a deeper engagement at the international level. The chapter begins with five overarching challenges for policy on tertiary education, training and research in Australia (hereafter the generic 'education' is used; unless otherwise specified, this includes training and university research). Then the chapter summarises eight specific policy problems and matches those problems to possible policy solutions.

Policy challenges

Australia faces five fundamental policy challenges in tertiary education and research. They are not easy challenges. But they are being successfully addressed in some other countries.

1 The global effectiveness of Australian education and research has become crucial.
2 Policy concepts of the knowledge economy are under-developed in Australia.
3 There is poor policy coordination between macroeconomic policy (particularly fiscal policy) and policy on the knowledge economy.
4 The public policy culture in tertiary education has degenerated.
5 Federal–state relations in education need to be reconstructed.

The global challenge

The task of the times is to fashion a proactive strategy in which the national policy agenda is aligned to the emerging global possibilities.[3] Some nations have already achieved a strategic fit between national agenda and global reality. For the United States, a nation of 300 million that contains 54 of the top hundred research universities, and is the global leader in information, communications and culture, the national knowledge economy agenda is the global strategy. For Singapore, a nation of 4.5 million for which cross-border work is the only way up, the global schoolhouse strategy is the national policy agenda.

Australia sits somewhere between, globally engaged but still essentially preoccupied by its domestic self and floundering for a global knowledge strategy. We have one of the world's top hundred super-computer sites; Japan has 16.[4] We are a top five exporter of education, but in global research, which in the long run has much broader

and deeper strategic implications for us, we have three universities in the second half of the top hundred.[5]

Table 6.1 shows that between 1988 and 2001 the number of scientific publications produced in Korea multiplied by 14 times, in Singapore six times, in China four and a half times.[6] China is now the world's second largest total investor in R&D after the USA. It has almost a million researchers. Its investment in R&D as a proportion of GDP has doubled since the late 1990s and is now just below Australia's, although our GDP per head is four times as large.[7] Meanwhile Australian institutions see China primarily as a place to sell teaching, not as a producer of basic research, and basic research capacity in Australia seems to be standing still.

Table 6.1: New Asia-Pacific science powers: growth in scientific papers 1988–2001

Country	Number of scientific papers in		Multiplication factor 1988–2001 (1988 = 1.0)
	1988	2001	
Korea	771	11,037	14.3
Turkey	507	4,098	8.1
Singapore	410	2,603	6.3
Taiwan	1,414	8,082	5.7
Portugal	429	2,142	5.0
China	4,619	20,978	4.5
Brazil	1,766	7,205	4.1
Australia	9,896	14,788	1.5

Source: National Science Board, 'Science and engineering indicators 2004'.

Australia lacks a policy concept of the knowledge economy

Arguably, in the global era, there are three distinct but intersecting national economies: the production economy (which remains predominantly national in character), the financial economy (which is predominantly global) and the knowledge economy (which has both a national and a world-wide component). The remainder of this chapter focuses on the knowledge economy.

The global knowledge economy consists of both national and institutional concentrations of capacity, mostly located in major cities, connected by global flows of people, ideas, research-based

knowledge and financial capital. It is continually being extended and intensified by globalisation, the global convergence of research, communications, language and culture.

Unlike the national knowledge economies of the 1970s, which as in the Whitlam and Fraser period in Australia were largely government funded and run as semi-autonomous units of the public service, the knowledge economy of the global era rests on a combination of private and public goods. It is fostered by public investment in basic research and in subsidised general education and training. It creates an immense volume of freely transferable public knowledge and also creates patents, commercial science, cultural commodities and university degrees with high income-earning value. It is not just about particular outputs, however. Above all, a knowledge economy is about long-term national capacity. A trained workforce and a national research infrastructure open up a broader set of options for the future, for the society in which they are located. They have the potential to continually add value to everything else.

Current policies of investment in education and research in the European Union, China and Singapore draw on theories of the global knowledge economy that are well understood by the central agencies of government. Such policy concepts have yet to play a central role in Australia in the Treasury and the Department of Prime Minister and Cabinet. Some in government see the 'knowledge economy' as a form of special pleading by universities. No doubt many educationists also see it as solely a marketing pitch, and they are uneasy with the term because it imagines education in economic terms (although it is hard to imagine any policy rationale for investment in education that would not have a material economic content). In other words, we are still stuck in the pre-knowledge economy era.

Poor fit between macroeconomic policy and knowledge economy policy

Since the 1980s the funding and regulation of tertiary education have been driven by two macroeconomic goals: first, constrain fiscal costs to strengthen the budget bottom line, and second, build education exports to relieve the balance of trade. In both cases the policy mechanism of choice has been full-fee international education. International student demand has been fostered by promoting

Australian education in Asia and by student visa policy and the immigration points system. The supply of places has been pumped up by cutting the public funding of tertiary institutions on a continuous basis—that's the most fundamental reason why government grants are not fully indexed—while deregulating international fees. The result has been an extraordinarily rapid growth in international student numbers, from 10,000 to a quarter of a million in less than two decades. The export industry is now worth $9.5 billion a year. Education is the fourth largest export industry in the nation after coal, iron ore and tourism, and it is only just below tourism.[8]

Note the clever symbiosis between fiscal policy and export policy. Fiscal reductions drive the growth of international students. Revenues from international students replace public funding, legitimate fiscal policy and protect the budget bottom line. The policy goals reproduce each other. But in the process something else has been left out. That is policy on the knowledge economy. In the outcome Australian fiscal policy and export policy, operating in tandem, have undermined the Australian knowledge economy.

The price is that institutions have become locked into building an ever-higher dependency on foreign student volume while other knowledge economy goals are on hold. More than 15 per cent of higher education income in Australia is from this source. The whole tertiary system is now dominated by the hunger for export revenue. It is not just Central Queensland University that puts mass international education ahead of other goals (see table 6.2). Except for the Australian National University, which has a different incentive structure because it has block funding for basic research, and perhaps the University of Western Australia because of its strong non-market private funding, all institutions are primarily focused on building volume in the global student market. In higher education, international students, nearly all in first degrees and postgraduate coursework with few high-quality research students, now constitute 25 per cent of all students and provide 15 per cent of all revenues.[9] In some universities, international student fees provide more revenue than does federal funding for domestic student places.

Meanwhile other national objectives, such as improving domestic participation rates, or better vocational training, or building capacity in basic research, or creating top-end global linkages with

Table 6.2: Proportion of university income from international students' fees in 2005

Institution	International students 2005	International student fee revenues 2005 ($ million)	Proportion of total university revenues 2005 (%)
1 Monash U	17,168	174.3	19.0
2 U Melbourne	8,936	168.1	15.5
3 U Sydney	9,003	136.8	13.2
4 Central Queensland U	13,837	132.1	45.7
5 RMIT U	15,017	129.8	25.4
6 U NSW	9,481	124.7	16.1
7 Curtin UT	16,092	108.2	24.5
8 U Queensland	6,330	104.1	12.0
9 Macquarie U	9,556	97.9	26.5

Source: Department of Education, Employment and Training, 'Statistics relating to higher education'.

foreign personnel at the cutting edge of innovation (and not just building mass enrolments in medium-quality business training), have been relegated to secondary policy goals, or non-existent goals. They are casualties of the relentless focus on export-at-all-costs.

In sum, federal government has achieved the goals of fiscal reductions and export growth at the price of our larger capacity as a global knowledge economy. Other nations are not making this mistake. The USA, China, Singapore and much of Western Europe invest in national knowledge capacity to build a broad-based, independent global competence. We disinvest in national knowledge capacity so as to build a narrow global dependence.

Why has such an outcome been possible without discussion and public debate? In tertiary education the public policy culture has degenerated: in institutions, marketing culture is seen to subsume the public good. Whenever individual vice-chancellors speak out on a public policy issue, this is seen first of all as an expression of interest. Policy statements by the former Liberal and National Party government were often polemical and politically driven, which is the governmental equivalent of the marketing culture. The minister exercised complete control over the Department of Education Science and Training (DEST) and the Cabinet treated the universities as a

potentially hostile political constituency. DEST achieved and still achieves a remarkable amount with a limited staff. But its officers rarely build deep expertise in specific policy areas. They are generalists, moved between desks at all too frequent intervals.

In this context the 'policy' objectives become to minimise responsibility (small target), to rinse out the complexity of issues and cheapen the cost of control by using formulaic mechanisms rather than expert judgement, to consult widely at selected moments in the political cycle but evade open-ended policy discussion in depth, and to secure short-term political mileage whenever possible, primarily with photo opportunities. It is clever politics, but it is not good government. What is missing is dispassionate long-term policy thinking.

Compare the shallow and polemical discussion papers that were produced by the Howard government in 2003 during the then Minister Brendan Nelson's *Crossroads* consultation,[10] with the policy documents that pioneered federal intervention in higher education almost half a century before, the Murray Report (1957) and the Martin Report (1964).[11] Crossroads generated almost as much paper. But Murray and Martin were overwhelmingly more intelligent. Despite the advance in information technologies, current federal administration is clearly superior in only two areas: accountability mechanisms and statistical collection. And when was the last time that the federal government made a major and enlightening policy statement on vocational education and training (VET)?

Compare also the Australian policy culture in tertiary education with, say, Finland, where long-term goals are seriously discussed, expertise is central and both vocational education and basic research have front-rank importance, or, more broadly in Europe, the quality of the discussion that permeates the Bologna process and the conferences on university rankings.[12]

A politicised stand-off between the Commonwealth and the states in education

The major casualty of the stand-off between the former Liberal and National Party federal government and the State Labor governments was VET. Since the federal–state funding agreement and coordination by the Australian National Training Authority collapsed in the late 1990s, no serious effort has been made to revive the agreement, the

coordination arrangements or the federal funding compact. This triggered a collapse in the resourcing of TAFE, the most under-funded public sector in education except perhaps early learning. The current Labor government has yet to tackle the problem.

However, the November 2006 High Court decision on Work Choices suggests that in the longer term the legal framework of federal–state relations in education is likely to change. The court's decision confirmed the general application of the federal corporations power to all organisations engaged in trade, which includes tertiary institutions.[13] It will be some time before the effects are fully manifest. But Work Choices has created the potential for a comprehensive federal legal regime. Sooner or later one or another side of politics will fill the vacuum. Federal–state relations in tertiary education will be revisited.[14]

Policy problems, policy solutions

The chapter will now identify the particular policy problems that have arisen in the wake of these five challenges. These problems are formidable. Federal commitment to public investment in tertiary education and research has declined sharply. Long-term capacities in basic research have been run down. Fees, loans and HECS arrangements are in a fragmented and confused state, and student financial support is at its lowest ebb since the advent of mass education. Domestic student participation is faltering, both in quantity and quality. Diversity of missions in public higher education has not been achieved. The global engagement of tertiary institutions is too narrow, focused almost exclusively on revenue raising from international students. Problems of standards are recurring, especially in international education. Last but not least, because it affects most of the other issues, the government–institution relationship has become highly stressed.[15]

Each of these problem areas, and possible solutions, will now be discussed in turn. In VET, the keys to a forward policy move are a new federal commitment and state–federal agreement on funding and policy. In higher education the policy blueprint prepared by the Group of Eight (Go8) universities, 'Seizing the Opportunities',[16] contains useful policy proposals.

Declining commitment to public investment

Given the growing importance of private funding in higher education, we would expect the public share of funding to fall over time, but something more has happened in Australia. The public share of funding has fallen very sharply, from 57 per cent of total funding in 1996 to 41 per cent in 2005.[17] Figure 6.1 shows the distribution of funds by source.

According to the OECD, between 1995 and 2003 public funding per tertiary student fell by 30 per cent per cent in real terms in Australia (see figure 6.2). Only Poland cut public funding per student by more than Australia (37 per cent). Of the 23 OECD countries for which data are available, 15 increased public funding per student.[18] Most nations are increasing both private and public funding, to create a growing mix of public and private goods. Not Australia.

Australia has increased international student fees and HECS payments, cut public funding and partly shifted the pattern of tertiary spending out of learning and research and into marketing. What have been the consequences? Let's look at the trend in the resourcing domestic students. In constant 2005 dollars, federal funding per

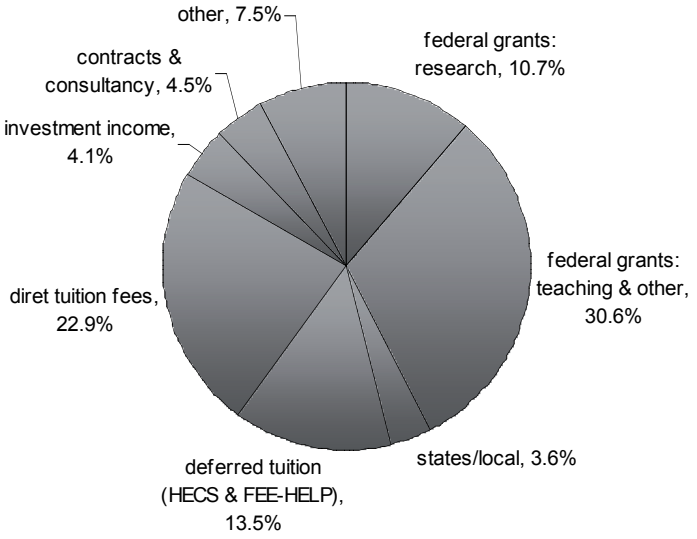


Figure 6.1: Sources of higher education revenue, Australia, 2005
Source: DEST, *Statistics Relating to Higher Education.*

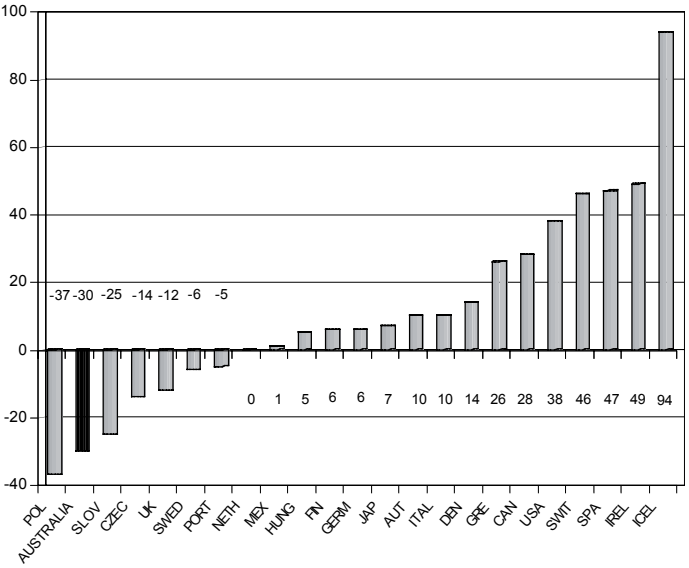


Figure 6.2: Percentage change in public investment per tertiary student, 1995–2003, OECD nations

Source: OECD, *Education at a Glance 2006*.

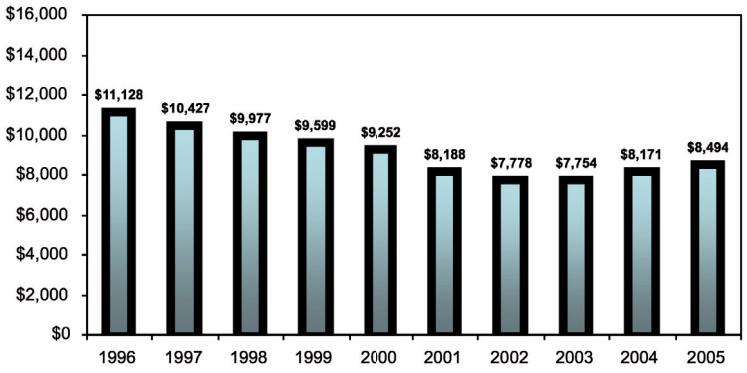


Figure 6.3: Public funding per subsidised place, 1996–2005

Source: NTEU, 'The funding of Australian universities 1996–2005'.

subsidised domestic student place dropped from $11,128 in 1996 to $7754 in 2003 before rising to $8494 in 2005 (see figure 6.3). Adding student HECS contributions, resources per domestic student dropped

by more than $500, despite a doubling of HECS, while prices in tertiary education outstripped inflation.[19]

However, while salaries have retained parity with some major comparator countries, student:staff ratios have blown out by a third, as figure 6.4 shows. Between 1996 and 2004 the average student:staff ratio in Australian higher education rose from 15.6 to 20.7.[20]

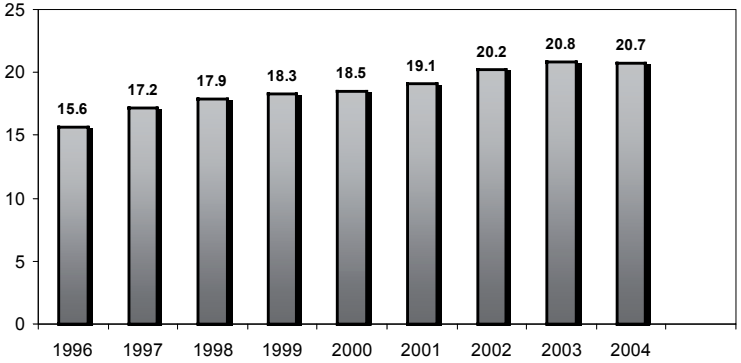


Figure 6.4: Average student-staff ratio, 1996–2004

Source: Universities Australia, '2006 student to teacher ratio for academic staff with teaching function'.

In 1995 total federal grants for non-government schools were three-quarters the level of federal grants for teaching in higher education. By the end of the decade spending was equal between the two sectors. From 2002 to 2005 the government did increase its direct funding for teaching in higher education from $3.2 to $3.5 billion, but its grants to non-government schools rose from $3.7 billion to $4.8 billion, 37 per cent higher than grants for teaching in universities.[21] Canberra has had a selective knowledge economy policy rationale for funding private schools but not tertiary education. As the Americans say, 'go figure'.

Possible solutions

Before we can have national consensus on the funding base we need consensus on the policy principles and architecture. There are also questions of priority. What should be advanced first? Vocational education? Student assistance payments, to encourage participation? The funding of HECS places? Research? Capital? These are all potentially

large expenditure items. Where do those priorities fall in relation to the needs of early childhood education and government schooling? In Australia the need to build early learning and vocational education is even more pressing than the renovation of higher education. I would argue that of all the funding needs in higher education the most urgent priority is to start putting more into basic research after years of disinvestment.

Long-term capacity in basic research

Increasingly, national research capacity is understood in terms of global competition based on measured research performance. It is instructive to look at Australia's position in comparison to the other English-speaking countries. All English-speaking nations are advantaged because English is the one global language of science. However, despite areas of strength, Australia's publication and citation quantity and quality lags behind the UK and Canada. These nations are larger than us, but the conclusion still holds when economic size is taken into account.[22] Australia has two universities in the world's top hundred for research performance, both in the second 50. Canada, with a GDP about 40 per cent larger than Australia's, has four such universities led by the University of Toronto at position 24. Toronto has the world's third largest volume of citations for research after Harvard and the University of Tokyo. The UK, with the same GDP per head as Australia and only three times the total GDP, has eight universities in the world's top hundred, including two placed in the top 20 on performance.

Basic research capacity in Australia has been an inadvertent casualty of the shift from public to private funding. In the pre-1987 universities basic research was supported from publicly funded teaching/research positions, including a notional average of 30 per cent allocated to research time. Since the late 1980s those positions have lost half of their public funding support on an average basis. Given that they are underfunded for teaching costs, it is ludicrous to assume—as the Bureau of Statistics data collection on research expenditure continues to assume—a system average allocation to research time.

Nearly all institutions, including most of the research-intensive Go8 universities, now depend on education exports on a massive

scale to plug the funding gap in teaching costs. Melbourne had 10,500 international students last year, 26 per cent of enrolments. They provided $192 million (16 per cent) in income.[23] International student fees can make only a marginal contribution to basic research. These revenues are mostly ploughed back into marketing, recruitment, teaching and facilities for international students; that is, into reproducing the revenue stream itself. At best international student income subsidises new facilities, services enjoyed by all students, some teaching of domestic students and a handful of research capacity. It cannot substitute for the public funding of basic research at scale.

The research policy waters have been muddied by hyper-emphasis on commercialisation, and the Mode 1/Mode 2 argument that the old distinction between basic and applied research has disappeared. In Australia there has been a sharp decline in the proportion of research categorised 'basic'. But there is a crucial difference between curiosity-driven researcher-led research located in longer-term research programs and client-driven research where the outcomes can be broadly anticipated in advance (although some research combines both!). Curiosity-driven inquiry remains a crucial, if not the crucial, source of intellectual innovation, and in many countries there has been a swing in research policy back to a renewed emphasis on researcher-led research and research training, in conjunction with the strengthened support for open-source approaches to national innovation system management. This policy sea-change, which is now obvious at the OECD, has yet to really take root in Australia, but the Productivity Commission has flagged it in a 916-page report on public sector R&D:

> Universities' core role remains the provision of teaching and the dissemination of higher quality, openly disseminated, basic research. Even where universities undertake research that has practical applications, it is the transfer, diffusion and utilization of such knowledge and technology that matters in terms of community well-being. Commercialization is just one way of achieving this. The policy framework for universities should encourage them to select the transfer pathway that maximizes the overall

> community benefits, which will only sometimes favour commercialization for financial gains.[24]

The Commission also made the argument that the public funding of university commercialisation of R&D can lead to crowding out of actual or potential R&D in industry.[25] But if policy turns back to a greater emphasis on basic research, will the universities have the necessary capacity? If not, what could be done to rebuild it?

Solutions

Under the Go8 policy blueprint, basic research would be underpinned by more National Health and Medical Research Council, Australian Research Council, additional infrastructure funding, and a new program of performance-based block grants. Block grants for basic research would continue the momentum towards separation of teaching and research support along UK lines. Many will have mixed feelings about this, but it is inevitable given the worldwide trend to concentration of research effort, accelerated by research rankings.

Block grants would allow more research-intensive universities to follow the ANU and concentrate research resources on a globally competitive scale. Research universities would no longer have to pump up any and every fee-charging place to secure differential resources. They could reduce their dependence on international students. They could nuance size and profile. They could compete more effectively in the international doctoral market. Block grants for research are the circuit-breaker. But this evokes further policy questions. If block grants are to fund a research mission genuinely competitive on the global scale—capable of lifting a university into the Jiao Tong top 50 research universities—it must be done at scale. So it can be done in only a small number of universities. Which? Melbourne, Queensland and Sydney are obvious candidates. But are the universities of Western Australia (long a high performer), New South Wales, Monash and Adelaide there? Non-Go8 universities?

Under the Go8 plan, all universities remain eligible for research project funding. The difficult questions arise in relation to the Australian Technology Network and Innovative Research institutions that have strong research in selected areas. This highlights the

potential of targeted research funds for centres of excellence, consistent with the development strategies of universities like Queensland University of Technology, which have made a decision to focus in the long term on research in specific areas of strength rather than to be research intensive in all fields of study.

Fees, loans and HECS arrangements

Since the mid 1980s the principal policy debate in higher education has been about tuition charges. Layer upon layer of 'reform' have become mixed together. We now have full-fee international student places, full-fee domestic student places with potentially different fees, Higher Education Contribution Scheme (HECS)-based subsidised places and different charges for students with permanent residence, all alongside each other. There are four levels of HECS charge and seven fixed rates of government subsidisation of places varying by discipline but regardless of institutional missions and actual costs. And that is after funding was simplified in the 2007 budget! There are different income-contingent repayment arrangements between HECS-HELP and FEE-HELP; and arrangements differ substantially between the public and private sectors. The Rudd government is committed to phasing out full-fee domestic student places but has not explained how it would rationalise HECS.

There is no clear in-principle basis in policy for the split between public and private costs, and for the many variations in that split on the basis of discipline, fee arrangement and sector. The system is confusing. Its costs, complexity and variety almost certainly inhibit participation.

Solutions

The Go8 paper would rationalise tuition and repayment, and eliminate the present anomalies, via a national scholarship system underpinned by universal income-contingent loans. The value of scholarships in different fields would be fixed by the Productivity Commission. Institutions would be able to vary tuition upwards by up to 25 per cent above the standard. Scholarships are a flexible policy instrument. Their rate and allocation can be tweaked to stabilise lower-demand institutions and subsidise participation of such groups as indigenous, lower SES and rural students. The Go8 plan is also a

one-off opportunity to create a transparent and stable relationship between public and private costs.

Domestic participation is faltering

In the global knowledge economy any and every improvement in educational levels generates public and private benefits. Thus we find that as the proportion of the population holding tertiary qualifications grows, the gap between the qualified and unqualified—in earnings, rates of workforce participation and rates of employment—is maintained or increases. This does not mean that any and every investment in education is optimal. There are other possible uses for scarce resources. It means that in knowledge economies the problem of graduate unemployment is no longer an issue. Hence there is a strong global trend to expanding participation. But Australia stands outside the trend, at least in relation to domestic students.

Between 1996 and 2005 the number of domestic students grew from 580,096 to 680,454 (about 100,000, or 17 per cent). The number of overseas students jumped from 53,188 to 239,495 (about 186,000, or 350 per cent).[26] The proportion of the 1997 year 12 cohort enrolling in higher education the next year was 40 per cent. By 2004 this throughput straight from school had fallen to 32 per cent (see table 6.3). The proportion going to VET did not increase much, from 37 to 38 per cent. Total tertiary participation of year 12 school leavers fell from 76.4 to 69.7 per cent.[27] And policy is neglecting adult skill building, as Terry Moran notes in chapter 1.

Table 6.3: Declining throughput from year 12, Australia, 1997–2004

Year 12 leavers entering:	1997 %	1998 %	1999 %	2000 %	2001 %	2002 %	2003 %	2004 %
Higher education	39.9	40.4	37.6	37.5	36.3	36.9	33.4	31.8
VET	36.5	37.5	37.2	41.9	38.5	39.5	39.6	37.9
All tertiary education	76.4	77.9	74.8	79.4	74.8	76.4	72.8	69.6

Source: Parliament of Australia, Senate, 'Questions on Notice', 8 August 2006, Question No. 1171, pp. 126–7.

Equally important, the quality of tertiary participation is under pressure. Between the 2000 and 2006 student financing surveys by the

Australian Vice-Chancellors' Committee, the proportion of students with federal financial assistance fell from 42 to 35 per cent, more students incurred debts, average loans increased, and average student spending fell. Belts are tightening. Seventy-one per cent of full-time undergraduates work full-time during semester, 40 per cent of full-time students working reported that work had an adverse effect on their studies, and one in four regularly miss classes. The indicators are worse for Indigenous students.[28]

Solutions

Higher rates of participation can be driven by scholarship-based subsidies, and by a renovated system of student financial support. If the latter takes the form of grants it is potentially very expensive. The better approach would be to add the bulk of student financial support to the schedule of income-contingent loans while allocating some grants on the basis of principles of equity and merit.

Diversity in public higher education has not been achieved

There is much talk about mission diversity in higher education, but real diversity is largely confined to the private sector where new missions are being fostered by FEE-HELP loans for tuition. In the public sector, policy still applies a uniform set of incentives and rules out negotiated missions and nuanced subsidies. All universities must be comprehensive as to role, must enrol mass international students and must pose as research intensive whether they are or not (and many are not). We still have a Dawkins-style uniform national system.

The exceptions are ANU, where special research funding has created a different set of incentives and activities, and Melbourne, which has struck out on its own as far as it can. Even so the university remains constrained by the common policy template. While the Howard government supported the switch to a graduate model of professional education, Melbourne's other objective of shrinking in size, to provide a better on-campus experience, is incompatible with the system settings in which all universities are growth dependent. There is no major source of additional resources other than student fees. When student numbers are reduced, staff and infrastructure do not fall in proportion. There is no revenue source with which to manage the diseconomies of scale entailed in becoming smaller.

Solutions

A key benefit of the Go8 plan is the scope for mission-based differentiation and nuancing of funding. Among other missions, this allows the federal government to support cross-sectoral linkages between VET and higher education.

Looking beyond the Go8 plan, it is time to reconsider the relation between TAFE and higher education. Vocational and preparatory courses have an increasingly important role in a global knowledge economy. Such nations as Finland and the Netherlands confer more dignity on their second sector than we do in Australia. The status barrier has been jealously maintained by higher education institutions. But many TAFE institutions are competent to provide degree-level teaching, and already do so under the auspices of universities. TAFE and possibly further VET institutions should be able to offer degree programs in their own right, perhaps accredited by state authorities as for private providers. Further, if TAFE was declared formally to be part of 'higher education'—just as two-year community colleges in the USA are classified as 'higher education'—this would provide a better basis for long-term cooperation.

The global engagement of Australian tertiary institutions is too narrow

The global higher education environment offers a broad range of strategic opportunities, as is shown in different ways by Australian education exports, the Bologna process and the rise of new science powers in Asia. Higher education institutions are forming cross-border consortia and partnerships across the full range of knowledge economy activity. Australian institutions are active in cross-border linkages. But most institutions are focused largely or entirely on one objective, revenue raising. Every other global connection is subordinated to that.

The marketing of Australian higher education in terms of a generic 'Brand Australia' helps the lesser-status providers to maintain export revenues, and disadvantages the Go8 universities that would like to market themselves in terms of individual reputation. But the problem here is not so much one of winners and losers as the fact that every institution is subject to uniform incentives and mission. The same logic of one-size-fits-all traps both the domestic missions of

institutions and their global missions. Victims of our own export success, perhaps? But the global positioning strategies of Australian institutions have been shaped by policy.[29]

Solutions

A principal benefit of funding differentiated missions via individual institutional compacts is that it creates the potential for institutions to develop a broader range of global linkages. It would allow Australian institutions to reposition themselves and escape the trap created by the monochrome commercial mission. Research-intensive universities could thereby start to leverage their domestic strength more fully across borders, in the manner of the US doctoral sector, for example through research collaboration, and the doctoral training of foreign students. The Go8 plan suggests 500 new Higher Degree Research scholarships earmarked to internationals. This is modest but it is a start. Some institutions could specialise in global student exchange with federal government support, as in Europe and Japan. More Australian students could be encouraged to go offshore—in this area there is a blockage in global strategy at present—by permitting them to use their entitlement to income-contingent tuition loans for enrolment in foreign education programs outside Australia.

In the longer run a more complex engagement in Asia depends on a growth in the national capacity in Asian languages, as both the Labor Party and the Go8 policy blueprint have proposed.[30] It will take time to create the teaching capacity in schools, but it is essential.

Problems of standards keep recurring

Problems of standards accumulate in a system in which there is downward pressure on resources for teaching, and quality assurance is run as a branch of marketing, slowing recognition of standards problems by fostering strategies designed to paper over the downturn in inputs. However, there are special, additional standards problems in the commercial market in international education. The commercial aim is to minimise costs and maximise market share and surplus revenues. Australia has become very good at the standardised processing of high volumes of business and computing students. But the commercial regime is in tension with the educational and cultural imperatives created by the nature of the clientele.

Half our international students speak one or another Chinese language and have learned English as a foreign language, not as a language of daily use. Language testing at the point of entry does not guarantee an adequate preparation in academic English or for learning in the students' chosen discipline. Nevertheless, institutions are loath to provide a higher level of academic preparation and support because of costs. Nor have they redesigned pedagogies to account for the prior preparation of students in their home countries, the obvious educational strategy, and one that would enrich local programs, but an option that again would raise unit costs. Some institutions are forced for economic reasons to take students who are marginal in educational and linguistic terms and cannot provide the extra help they need. There are also many anecdotes of soft marking to sustain student throughput and thereby revenues.

The Australian Universities Quality Agency (AUQA) has secured improvements in the consistency of provision. But the problem of standards is not easily dealt with. It cannot be eliminated by pathologising extreme cases. It is endemic to the policy settings.

Solutions

The export industry will remain a major factor, and it is essential to tackle the recurring problems of standards, which, as noted, are not confined to international education. The Go8 plan has nothing much to say about this. But a range of measures can be applied.

First, there is a need for a standards commission or council, as the 2006 Labor Party policy suggested.[31] A standards council would combine a program of regular reviews with the power to intervene at need. It would have to be managed carefully to prevent it from bringing non-academic criteria to bear on academic affairs. Second, it is in the national interest, in both commercial and educational terms, to subsidise the English-language preparation of international students, for example foundation semesters, perhaps on a matching funds or mixed public/private basis. Another initiative would be the funding of programs designed to secure closer cooperation between Australian educators and Asian secondary and tertiary institutions that provide international students for Australia.[32]

The government–institution relationship is highly stressed

Until the late 1980s the statutory Tertiary Education Commission ran higher education policy at arm's-length from institutions, maintaining respect for academic freedom. But from the Dawkins reforms onwards, independence has been eroded. Although the proportion of funds provided by federal government has fallen, government has intensified micro-control. The means of control include reporting requirements; the shaping of institutional innovations via competitive bidding; and the performance management mechanisms for classifying, measuring, shaping, prioritising and second-guessing research. The Research Quality Framework is the latest example. Institutions have gained more scope to earn money and spend what they earn, which has been important. But if research universities, particularly, are to operate at the global cutting edge, creative independence is equally vital. Once a government shapes content, either directly or indirectly, it is a slippery slope indeed. The federal government went over the edge when minister Brendan Nelson intervened two years running in Australian Research Council project decisions based on academic merit.

Solutions

The Go8 proposal is for an Australian Tertiary Education Commission (ATEC) responsible for planning, resource allocation and regulation of tertiary education. ATEC would be accountable to federal government and to a combined state–federal ministerial council. It would consist of a board, councils for higher education and for VET, and a secretariat with functions in research and data collection, policy formulation and administration. It would manage the Australian Student Financing Service, integrating scholarships, loans and income support. A standards council could be added.

ATEC would work within a funding envelope specified by government, while operating at medium distance from government and institutions. It ought to be free of short-term politicking. It would absorb part of DEST but be grounded in a different culture. With the right appointments ATEC could restore balance and sanity to the politics of tertiary education.

ATEC would negotiate each institution's mission and target investment to support it. It would negotiate the VET–higher education

compact. It could frame a new federal–state compact for a post–Work Choices legal regime. It would negotiate with the economic arms of government, on knowledge economy policy, including targets for public investment. It would reconcile the global setting with national system and institutions. It would shift part of the focus of government from the current obsession with short-term indicators into long-term planning.

Providing it is given the autonomy and the support it needs, ATEC is the key to the renovation of higher education and research in response to the global challenges.

Notes

1 Named after the then Australian Minister for Employment, Education and Training, John Dawkins.
2 Marginson, S., *Educating Australia: Government, Economy and Citizen Since 1960*, Cambridge University Press, Cambridge, 1997.
3 Marginson, S., and van der Wende, M., 'Globalization and higher education', paper prepared for OECD, Paris, 2007, available at: http://www.cshe.unimelb.edu.au/people/staff_pages/Marginson/Marginson&van_der_Wende2006OECD.pdf (accessed 31 May 2007).
4 'Top 500 supercomputing sites', at: http://www.top500.org/list/2006/06/100 (accessed 24 May 2007).
5 Shanghai Jiao Tong University Institute of Higher Education (SJTUIHE), 'Academic ranking of world universities', 2007, at: http://ed.sjtu.edu.cn/ranking.htm (accessed 15 March 2007).
6 National Science Board, 'Science and engineering indicators 2004', 2006, at: http://www.nsf.gov/statistics/seind04 (accessed 9 April 2006).
7 Organisation for Economic Cooperation and Development, 'China will become world's second highest investor in R&D by end of 2006, finds OECD', media release, OECD, Paris, 4 December 2006.
8 Morris, S., 'Education a huge, and growing, economic boon', *Australian Financial Review*, 9 October 2006, p. 1. In 2008 the total value of education exports was revised to $12.5 billion, and education moved past tourism to become the third largest export sector.
9 Department of Education, Science and Training, 'Statistics relating to higher education', 2007, at: http://www.dest.gov.au/sectors/higher_education/publications_resources/statistics/default.htm (accessed on 22 May 2007).
10 For example Commonwealth of Australia, *Higher Education at the Crossroads*, Department of Education, Science and Training, Canberra, at: http://www.backingaustraliasfuture.gov.au/publications/crossroads/default.htm (accessed 28 October 2008).
11 Murray, K., *Report of the Committee on Australian Universities*, Commonwealth Government Printer, Canberra, 1957. Martin, L., *Tertiary*

Education in Australia, Vol. 1, Report of the Committee on the Future of Tertiary Education in Australia, Australian Universities Commission, Melbourne, 1964.

12 Marginson, S., and Van der Wende, M., *Globalisation and Higher Education*, Education Working Paper No. 8, OECD, Paris, 6 July 2007; at: http://www.oecd.org/dataoecd/33/12/38918635.pdf (accessed 28 October 2008); Marginson, S., 'The external dimension: Positioning the European Higher Education Area in the global higher education world', prepared for European Commission EHEA Bologna 2020 conference, Ghent, 19–20 May 2008; at: http://www.cshe.unimelb.edu.au/people/staff_pages/Marginson (accessed 28 October 2008).

13 'The regulation of the activities, functions, relationships and the business of a corporation described in that sub-section, the creation of rights, and privileges belonging to such a corporation, the imposition of obligations on it and, in respect of those matters, to the regulation of the conduct of those through whom it acts, its employees and shareholders and also, the regulation of those whose conduct is capable of affecting its activities, functions, relationships or business' (Gaudron J in *Re Pacific Coal Pty Ltd; Ex parte Construction, Forestry, Mining and Energy Union* (2000) on the potential coverage of section 51 (xxx) on the federal corporations power; 'This understanding of the power should be adopted', para. 178, majority in *Work Choices* decision, HCA, November 2006).

14 Marginson, S., 'Federal/state relations in education and the 2006 Work Relations case', paper presented at Institute of Public Administration Australia (IPAA) & Academy of Social Sciences Australia (ASSA) Policy Roundtable on Federalism, 17–18 May 2007, University of Canberra, Canberra.

15 There are many other policy issues that might be discussed, such as social equity in access and success, the quality of teaching, the application of ICTs in learning and assessment, the relationship between general and vocational programs, and mobility between tertiary sectors, institutions and work-based learning. The chapter focuses on the larger federal policy settings.

16 Group of Eight, 'Seizing the opportunities', Canberra, 6 June 2007, at http://www.go8.edu.au (accessed 6 July 2007).

17 DEST, *Statistics Relating to Higher Education*.

18 Organisation for Economic Cooperation and Development, *Education at a Glance 2006*, OECD, Paris, 2006.

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Chapter 7

Confronting challenges for universities

Michael Gallagher
Executive Director, Group of Eight universities

'Australian policy-makers seem almost oblivious to Australia's slippage against the world's leaders in research and innovation. Similarly, it seems to be going unnoticed that we are presenting a Brand Australia that is at best confusing. The former is disturbing because of Australia's need to access the 99 per cent of world knowledge generated elsewhere. The latter is concerning because of the high level of university dependency on income from foreign fee-paying students in the context of diminished public investment.'

Michael Gallagher was appointed Executive Director of the Group of Eight (Go8) in May 2007. Before that he was Director of Policy and Planning at the Australian National University, and responsible for the Commonwealth administration of higher education from 1990 to 1994 and again from 2000 to 2002. This chapter was first presented as a paper on 9 July 2007.

Introduction

Australia's capacity for higher education policy research and analysis has eroded since the 1980s, at least in the areas of the public sector where it was formerly significant, both in government agencies and departments[1] and in universities, where Melbourne University and the University of New England are now the only substantial players, although they are both small units. Other former higher education policy centres have either withered or turned inward to focus on academic development.

There has been some growth of private sector capacity through consulting firms and think tanks, the latter tending to be politically aligned. Since around 2001, the Department of Science, Education and Training (DEST) has made much use of external consultants in mapping activities, scoping issues, consulting interest groups and examining options. Many in the sector have felt that those processes have increased inclusion in policy discussion, although the frequent disconnects between those processes and eventual decisions has caused some disillusionment, whether the 'Crossroads' exercise or the Education Action Group (EAG) to Development Advisory Group (DAG) elements of the Research Quality Framework (RQF) exercise.

There seems concurrently to be greater influence exercised through informal ways and means by individual institutions, persons and interest groups. Perhaps this makes the advisory process more contested and decision-making more responsive if less transparent, but it is not evident that the policy outcomes are sounder or more coherent.

Associated with these shifts in the consideration of policy since the 1980s at least has been a government-driven agenda to which universities have been mainly reacting and complying rather than contributing. Importantly, much of that government agenda has not been about higher education policy per se but rather about fiscal policy, labour market policy (including immigration policy), labour relations policy, and public sector administrative and governance reform along with (more recently) challenges to the allegedly dominant 'soft-left' institutional values culture.

Interestingly, in day-to-day relations between the academic, government and business communities other matters are discussed, such as those relating to trade, strategic issues, environment, demography

or health, yet higher education policy (with the exception of education exports) has not reflected these dimensions of the contemporary role of universities. Financial relations are also increasing with these other areas of government and industry.

It has become more demanding for higher education policy centres to grapple with these wider cross-portfolio agendas. Nevertheless, if universities are to shape the future policy agenda, or at least be influential voices in its shaping through sound claims and critiques, then centres of higher education policy analysis and research will become ever more important. Among the future challenges for such centres, whether in universities or sectoral bodies or elsewhere, will be those relating to linkages with centres of expertise in other policy areas, as well as international linkages.

The Go8 policy paper

All this is to say little other than that higher education straddles government portfolio boundaries and is necessarily bound up in the global knowledge economy; which presents new challenges even to the best of nationally connected governments, horizontally across ministerial portfolios and vertically among levels of government in federal systems.

The main implications for universities are that they need to be connected with this new operating environment in ways that matter and to bring to their relations with government considered and timely proposals together with a principled understanding of trade-offs. The flip side of the relationship is also important; that is, that governments need to appreciate the dynamic competitive world in which universities operate, and allow them the flexibility to function responsively. They cannot do so if governments treat universities as part of a centrally managed school system. That is one of the key messages in the Go8 discussion paper 'Seizing the Opportunities':[2] if governments continue to over-regulate and micro-manage universities and fetter their discretion through a myriad of specific-purpose funding schemes, each with varying conditions attached, Australia will lose out through the inability to shape up in the intensifying international fight over intellectual talent.

Of course, another message is that the Go8 sees it has the responsibility to make its policy preferences clear and not be satisfied with,

or be assumed to comply with, ill-conceived or ill-constructed policies from whatever side of politics, particularly if those policies may do damage to research universities. For instance, I wonder who has noticed the reduction in the share of higher education R&D dedicated to basic research, from 64 per cent in 1990–91 to 52 per cent in 2004–05—in a country whose reliance on university research within its total R&D effort is almost double that of the OECD average? That is a big shift in 15 years, and a curious one given the Productivity Commission's recent comments about the importance of the basic research function of Australian universities.

But to return to 'Seizing the opportunities'. It is ironic that almost a decade after the work of the Committee of Review of Higher Education Financing and Policy, chaired by Roderick West, the Go8 has issued a discussion paper with proposals along similar lines to those of that committee. The West Committee developed recommendations to government on a more holistic approach to lifelong learning and student-centred funding. The West Committee had few champions in the university sector, or anywhere else.

Timing is everything in public policy. The West Committee was formed to provide safety-net advice for fallback options in the event that the measures adopted for giving effect to the decisions of the 1996 Budget to cut higher education outlays had adverse consequences. The West Committee's draft proposals were quickly ruled out by the Prime Minister in the run-up to the 1998 election because they exposed the government to additional political risks.

A subsequent set of recommendations reflecting a modification of the West Committee's final recommendations were almost taken to the Cabinet by the then Minister David Kemp only to be leaked to the Opposition, leading the Prime Minister to announce in October 1999 that fees would not be deregulated; vouchers would not be introduced; the Higher Education Contribution Scheme (HECS) would not be charged for Technical and Further Education; the current HECS system would remain; there would be no additional loan system or real interest rate attached to the current HECS system; the current system of government subsidies and funded places would remain, as would the prohibition on charging fees for HECS-liable places.

As it has turned out, some of those policy features have since been ruled in, suggesting that they were not ruled out on their

substantive merits. This is not to say that the West Committee's proposals or those of Dr Kemp might not have been found wanting with more considered evaluation, but merely to emphasise the fact that the prevailing circumstances dictate, policy windows open and close quickly and the opportunities for influence can be fleeting. It does not matter how compelling the rational-empirical case may be. Anecdotes that reveal perceptions of political risk have clout.

From a public policy perspective, the run-up to an election presents double-edged opportunities for interest groups to advocate for a change in policy direction. On the one hand, matters of higher education and (but, curiously, to a much lesser extent) research can gain some attention, typically when non-government parties make electoral inroads through their criticism of government policy and their proposed initiatives. Arguably, the ALP White Paper issued by Jenny Macklin in 2006, which criticised the rigidity of funding clusters and put forward some novel ideas, gave impetus to the partial deregulation measures announced by the minister, Julie Bishop, in the May 2007 Budget.

Additionally, the possibility of political change opens up room for consideration of alternatives to the policy status quo. On the other hand, all propositions are received from a politicised perspective, with the risk that argument if not evidence is interpreted as partisan. Additionally, the more radical the proposal for change, the more likely it is that those who fear they will lose will be more vocal than those who think they might gain.

It is not in the interests of those advocating reform, nor of political parties that may need to adopt the proposals in some measure in government after the election, to have particular options ruled out prematurely. Meanwhile, it is important that debate continues within the sector to clarify areas of agreement and disagreement, with a view to presenting as solid common ground as possible on matters of overarching sectoral interest, noting that on some important matters there will be sharp differences within the sector and it will suit no one to blur or seek to bury them.

To the extent that the proposals for change unsettle the established understandings, the debate can become fraught. In the case of the Go8 paper, the cheap shot is to dismiss the propositions as self-serving for elite Go8 universities, on the assumption that what is

good for them cannot be good for others. Thankfully, only a very few have attempted to fire that shot, and their efforts have not reflected well on them. For the most part, the reactions of non-Go8 commentators have been reasoned and balanced. Most have welcomed the contribution to the debate. There is some wariness, understandably, but also a willingness to look for points of agreement about deficiencies in the current policy framework and measures that might provide greater operating flexibility and sustainability in the future.

There are concerns about a shift to demand-side financing and the use of national merit lists for the allocation of scholarships to students. There are concerns that regional universities will be disadvantaged and that damage will be done to equity of student access. There are concerns that some fields of study will become unviable for want of student demand. There are concerns that research concentration will entrench the advantages of the longer-established universities and make it more difficult for newer universities to develop their capacities. There are concerns from other quarters that actual teaching costs are elusive and arbitrary price caps will restrict the operation of market mechanisms.

The Go8 paper suggests there are ways of addressing some of these concerns through the weighting of scholarships to encourage the participation of students from particular equity groups and to give incentives for study at regional universities. The Go8 paper also proposes an element of direct funding to universities, such as for sustaining scholarship in fields of low enrolment, and for community engagement and knowledge transfer functions independent of teaching scale. The idea is that the mix of incentives should enable each university to play to its strengths.

If that means that the strongest (at least in terms of accumulated resource and reputation) should get stronger, it does not necessarily follow that the weakest will get weaker. Rather, the weaker institutions (those with less capacity) should also grow stronger, for it is not a static zero sum game.

Diversity of mission

However, the real question is not about strength alone but fitness relative to mission, and what is important for the community is that

each university has strength of purpose and capacity to fulfil its own mission.

Most of the Go8 universities are not seeking to grow their domestic undergraduate numbers. Competition for volume is likely to be outside the Go8. Under the current framework the only semi-discretionary source of government funding for universities relates to research and research training, and as the funding for teaching is tied up, all universities are aiming to raise their research income. Funding for community engagement, and resourced collaboration via a hub-and-spokes model in respect of research, should serve to widen income options and reduce the pressures on some institutions to emulate research intensive universities while expanding opportunities for their staff to undertake research.

Nevertheless it has been suggested that the overall Go8 approach is inappropriate and that non-Go8 universities should be given the chance to build up and not be discriminated against on grounds of age. Do we wait until every post-Dawkins university has had the chance to catch up with the pre-Dawkins universities? Can we afford to do that as a nation when the rest of the world is not waiting for Australia to catch up? Should we accelerate skewing the distribution of resources to bring the lowest up to the highest? Do we have the resources to do that—the human as well as the financial resources? Should we aim to level our performance peaks, or is it self-defeating even to attempt to do so?

A policy framework that promotes emulation by default runs counter to any policy objective of structural differentiation as a means of widening student choice. Martin Trow has noted that 'a central problem for higher education policy in every modern society is how to sustain the diversity of institutions, including many of which are teaching institutions without a significant research capacity, against the pressure for institutional drift toward a common model of the research university. The effort alone shapes the character of an institution to be something other than what it is—a prescription for frustration and discontent.'[3]

The Go8 paper addresses this issue, noting:

> At the core of the dilemma is a single image of a university and a set of assumptions, in the academy if not in the

> community, that confuse institutional status with institutional purpose and performance … It is the tendency of tertiary education institutions, if driven by academic norms alone, to narrow their purposes and define their differences in terms of hierarchical rather than horizontal relations. The sustainability of a diverse system requires interactions between specialist institutions and other organisations in the community in which they function. Tertiary education institutions have a responsibility to define their roles in relation to the needs and expectations of the communities they serve. The definition of their roles should be the subject of period reappraisal involving consultation with internal and external communities.

The Go8 proposals are based on the concept of the locally engaged, internationally competitive university. This line of thinking moves away from either a provider-centric approach or a government-control approach; that is, universities own themselves but they must serve their communities to sustain the trust that underpins their support. A contemporary approach to rebuilding university–community relations should encourage diversification in the roles and forms of universities.

Frans van Vught has suggested two principles for explaining the extent of differentiation within higher education systems. The first relates to the exogenous structure of incentives, and the second to the endogenous culture of organisations. He notes: 'the larger the uniformity of the environmental conditions of higher education organisations, the lower the level of diversity of the higher education system', and 'the larger the influence of academic norms and values in a higher education organisation, the lower the level of diversity in the higher education system'.[4]

We can see normative prices (common rates of funding per student place) and volume quotas (supply lock-ins lagging student demand) as elements of the uniformity of environmental conditions. They now sit at odds with universities that operate more fluidly in international competitive markets. But that is only a part of the story. The notion of sameness pervades the policy culture as well as the policy frameworks, whether through Australian Universities Quality

Agency (AUQA) audits to lowest common denominator standards, or the Learning and Teaching Performance Fund with its lack of recognition of differences in the standards of learning outcomes.

The over-riding need is to free universities to serve the community in the best ways they can. There is a need for strongly performing universities contributing to the economic and cultural development of communities that include groups who are marginally attached to society. There is nothing subordinate in such a role, and it needs to be valued as an essential ingredient of an inclusive, productive society.

The global dimension

The contemporary challenge is that the commonalities of domestic policy translate into perceptions internationally in potentially damaging ways. Australian policy-makers seem almost oblivious to Australia's slippage against the world's leaders in research and innovation. Similarly, it seems to be going unnoticed that we are presenting a Brand Australia that is at best confusing. The former is disturbing because of Australia's need to access the 99 per cent of world knowledge generated elsewhere. The latter is concerning because of the high level of university dependency on income from foreign fee-paying students in the context of diminished public investment.

Colombo Plan students who came to Australia to study for a degree were predominantly students of quality who went back to their home countries to occupy positions of significance in business and government, giving Australia networks of influence for advancing our trade, strategic, diplomatic and scholarly interests. Today the top students from those countries tend to study at the top universities in their home country or in the prestigious universities of the US and UK. We struggle to attract students from the next-best tier of educational attainment into bachelor degree programs and masters courses. Our top universities are struggling to attract the top-quality PhD students. Overseas graduates of Australian universities are largely taking up positions down the pecking order in their home countries, and our future degrees of influence will sadly reflect that reality for years to come. Australia's interests will not be advanced if we continue this practice. Rather, we should be considering a contemporary equivalent to the Colombo Plan whereby Australia sponsors talented PhD

students and post-docs from selected countries to study in Australia. When they graduate Australia will be better able to build relationships to sustain access to the world's knowledge networks and participate at the quality end of international business.

Australia eschews in its official international education promotion, such as through AEI, the halo effect that the British Council exploits so brazenly in its marketing. If Australian higher education is presented as 'an average good sector' with 'parity of esteem of degrees', it is no wonder we are taken lightly. Ask any Japanese, Chinese or Korean student, and they will tell you the rankings of universities in their home country and worldwide. They know where Australian universities lie on the league ladders, and it is naive to pretend otherwise.

The league ladders that matter largely reflect the quality of universities' research performance. The PhD is a special qualification in this context, especially for Australia where it is assessed on the basis of a minimum of two-thirds of a candidate's work being research. The PhD is arguably the qualification that defines the heights of the educational and research standards of a country. If the PhD is awarded frivolously, the integrity and reputation of the whole sector is at risk. We might call this the 'horn' effect, the devilish obverse of the halo.

The rapid growth of PhD enrolments and graduations across Australian universities seems not to have been subject to scrutiny. There appears to have been rapid growth of PhD enrolments in fields and institutions that do not have demonstrably strong research performance track records. There are also relatively high shares of PhD enrolments in a number of universities that draw larger than average shares of their international undergraduate students from countries where tertiary education standards are generally not high. It is simply not clear what standards apply and how they vary across fields and institutions.

The two main international education markets into the future, China and India, are not receiving reassuring signals from Australia. Let us consider India. Here we have a classic case of Australia putting short-term gains ahead of longer-term benefits. Most of Australia's international education engagement with India is immigration-driven and concentrated in low-priced providers. In higher education, the great bulk of Indian students are to be found in a few

institutions at the lower end of the reputational ladder. In India, the impression of Australian higher education is predominantly one of low quality. Clearly India, with a population projected to exceed 1.5 billion by 2050 and a rapidly rising middle class, is an important market. But Australia's engagement with India needs to be based on deeper foundations. We should be developing links with the Indian institutes and top universities, but to do so will require some universities to differentiate, perhaps to separate, themselves from the bulk Australian image.

Conclusion

So the bad news is that we face some uncomfortable dilemmas. They illustrate just how damaging the sameness model has been, and continues to be, and why it is necessary to break the mould. The good news is that we are beginning to discuss them. We need more exploration of these issues. Because they are so important they cannot be left to drift, unaddressed by policy-makers.

If we do not indicate ways by which the issues can be addressed, then either they will be ignored or governments and other bodies, not only in Australia, will make decisions that might not suit our universities. If that happens it is hard to see how Australia can advance.

Notes

1 Commonwealth Tertiary Education Committee and National Board of Employment, Education and Training, Department of Employment, Education and Training and Department of Education Science and Training.

2 Group of Eight, 'Seizing the opportunities: A policy framework of balanced incentives for higher education and university research', National Press Club address, 6 June 2007.

3 Martin Trow, 'On mass higher education and institutional diversity', in *University Education and Human Resource*s, Technion–Israel Institute of Technology, Tel Aviv, 2003.

4 Vught, F. van, 'Isomorphism in higher education? Towards a theory of differentiation and diversity in higher education systems', in V. L. Meek, L. Goedegebuure, O. Kivinen & R. Rinne (eds), *The Mockers and Mocked: Comparative Perspectives on Differentiation, Convergence and Diversity in Higher Education*, Pergamon, Oxford, 1996, pp. 42–58.

Chapter 8

Research, innovation and knowledge transfer

Professor Margaret Gardner AO
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'Any cursory strategic view of the international research and innovation landscape would suggest the allocation system in Australia is a second-order issue … Australia's policy measures are focused on rewarding excellence and concentrating research funding and research training. This is a quality enhancement focus. It is not the same as building research capacity. We need a policy system that funds research so as to build research capability for the future, as well as providing higher overheads for competitive funding and so rewarding research excellence.'

Margaret Gardner has served as Vice-Chancellor and President of RMIT University since 2005. Prior to that she was an academic in the field of industrial relations, before holding leadership positions at Griffith University and the University of Queensland. Margaret has also contributed to public policy formation as the head of two state government taskforces in Queensland. This chapter was first delivered as a paper on 6 August 2007.

Introduction

In public policy in the last two decades we have witnessed the emergence of research as an integral part of the process of innovation that fuels economic development. This policy shift is evident not just in the leading research nations but also in economic development agendas across the globe, and is particularly evident in the Asia-Pacific region. Innovation is seen as the key to increasing the value of goods and services. It is the mechanism by which we trade the old for the new. The wealth of our future economies is to be found principally in new knowledge and ideas, and these intellectual breakthroughs are produced largely through the scientific and technological disciplines.

While research is not the only path to innovation, it is fundamental to much of the development of new knowledge and ideas. Whether we see innovation deriving in clear sequence from the application of fundamental research ideas, or as a twisting and iterative set of developments that brings new ideas to light and into operation, research is involved. Research contributes both to the generation of fundamental shifts in understanding and to the testing and evaluation of ideas for new products or services.

Once trade in new knowledge and innovations became important for economic development, then public policy changed. Unlike economic development that is based on control of key physical resources, whether land and water for agriculture, or minerals, or dependent on proximity to large markets for physical trade of goods or delivery of services, it seems that knowledge can be more easily acquired within and across nations, particularly when communication modes are so global and ubiquitous.

The knowledge economy is not only critical to the future of nations but also one in which many feel they can participate, even if some nations have a substantial start on others. The April 2007 ALP policy paper on innovation, competitiveness and productivity, prior to the federal election, stated the importance of policy in this area succinctly, in the phrase 'industry policy is innovation policy'.[1] The previous Howard government policy position, outlined in *Our Universities: Backing Australia's Future*, acknowledged research and innovation as vital to 'building Australia's competitive strength in a global knowledge-based economy'.[2]

In a global knowledge economy Australia has no inherent advantage in sustaining high-level performance, only a small head start on some other nations. That head start, deriving from Australia's current research strength, is the product of the past public investment in research and the resulting ability to engage with high-quality research internationally. Innovation in Australia, given our size, depends not only on engagement with industry or capacity to begin enterprises but also on being part of global industry networks. Public policy for research and innovation is grounded in this understanding of the national economic futures.

In this chapter I will focus on questions of research policy in Australia, while acknowledging that this is only one part of overall innovation policy.

Lessons from success

Research policy in most countries is distinguished by mimicry. Many policy-makers see as their ideal the research/industry configurations of Silicon Valley or North Carolina's research triangle or Boston's Route 128. Regardless of the particular circumstances underpinning these successful clusters of activity, a series of general features derived from this experience have found their way into public policy in many countries.

One lesson derived from these apparently optimal cases is that the public good and private benefits of research are intermixed. It is not simply that research funded by the public purse is transformed to produce private benefits for industry, and from there contributes to the general good; it is that the private benefits of the research are partially captured for the university and the researchers as well as for industry. Another lesson is that high-quality research institutions can attract industry to an area and can seed new industries and companies. Leaving aside questions about how 'easy' it is to replicate optimal cases such as Silicon Valley, the policy drive to do so has three features.

The first feature is the underpinning of public support for research. This has two aspects, one reinforcing the public and the other the private good. One aspect is public funding for research infrastructure, research projects and researchers in universities, research institutes or other public agencies. The other aspect is a legal

framework that protects the private benefit of research via property rights, such as in patents and related mechanisms.

The second feature is encouragement of collaboration. Policy has focused on bringing universities and industry together in research projects or centres, encouraging matching funding and rewarding work where industry and research institutions are jointly engaged.

The third feature is support for technology transfer or knowledge transfer. Into this category of initiative come networks and intermediaries to assist industry and business (particularly small and medium enterprises) to gain access to research; tax and other incentives, to encourage research and development in industry, or to encourage firms and industries to locate in areas adjacent to research institutions.

In this last area of technology or knowledge transfer, the need for venture capital to assist in commercialising research is often mentioned. However, access to such funding is not widespread. John Douglass notes that in the USA a number of states have set up venture capital funds to attract the private sector investment needed for new start-up companies, and many states have set up their own publicly funded research institutes, usually in collaboration with a network of universities, to tackle large-scale research issues.[3] This sort of initiative is found at subnational level in other countries, including Australia.

Australian public policy for research

This broad framework for research and innovation dominates public research policy in Australia as in other countries and therefore has direct implications for universities, which is my particular concern in this chapter.

First, underpinning public support is provided through 'block' grants to universities and project funding to researchers or groups of researchers. Funding for postgraduate research students, the Research Training Scheme, is provided to universities for a specified number of places. Two features of policy are specific to Australia: access to the schemes is available to all universities; and the allocation of block funding and RTS places is performance-based: it is tied to formulae that allocates against past research performance.

Research infrastructure is funded in a variety of ways, through the overall capital funding available to universities through Commonwealth funding and through specific grants. The National Collaborative Research Infrastructure Strategy (NCRIS) is a comparatively recent innovation that is contributing successfully to enhancement of research infrastructure by allowing for large infrastructure projects that provide access for researchers from a range of institutions. The largest single recent investment in shared research infrastructure, however, was largely funded by state government, with the Victorian government's multimillion dollar contribution to the Melbourne-based Synchrotron. Research project grants are competitive and peer-assessed.

Second, collaboration between universities and industry is encouraged through a range of schemes, principally through project-based funding (Australian Research Council Linkage grants) and through the Cooperative Research Centres program. In recent years, the Howard government increased funding for CSIRO to enable development of large-scale collaborative partnerships that reflect the national research priorities. A major initiative of state government in Queensland, Victoria and Western Australia has been to create funds that support collaborative research projects and initiatives.

Third, support for knowledge or technology transfer is provided through a number of federal funds, as well as state-based funds, that support commercialisation of research. Examples of this support include the Biotechnology Innovation Fund, which makes competitive grants. (I will not deal further with knowledge transfer and innovation policies in this chapter as it is primarily focused on research policy.)

The key feature of Australia's research policy is that underpinning funding, while spread across a range of institutions, is allocated to universities on a competitive performance basis. Australia is one of a small number of countries with a highly formulae-driven competitive performance-based 'block' funding system for research and research training. These formulae typically magnify success in competitive grant schemes through the block funding system. It is a system premised on the importance of rewarding excellence as the mechanism to create internationally strong research outcomes.

In addition to this basic policy architecture, there have been interesting initiatives that have recognised Australia's particular circumstances when crafting policy to build research and innovation, principally ARC Linkage grants, the Cooperative Research Centres (before the recent concentration on commercialisation), as well as NCRIS. In the first case, government funding induces industry contribution to research to build university–industry links and facilitate knowledge transfer and innovation. In the second, the cost and scale of research infrastructure needed to be internationally competitive is recognised and supported by encouraging collaboration in the use of such infrastructure. Both cases recognise the comparatively small scale of industry research in Australia and the need for public support to build internationally competitive outcomes.

Where to from here?

We know about the general direction of policy needed to foster research and innovation, the increasing importance of being able to participate effectively in the 'knowledge economy', and the growing focus on and spending on research and innovation in the Asia-Pacific region. We know that Australia maintains a strong international reputation in some areas but that the challenges in maintaining that performance are many. What would we expect to be the major policy concerns of government for the next few years?

Public support for research

One crucial question is whether we have sufficient underpinning public support for research to be internationally competitive. Here there are two issues in relation to international competition, particularly in science and technology research: quality and scale. Neither issue can be neglected.

There have been some increases in public funding to research in recent years, principally to granting agencies such as the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC), plus extra funding to research infrastructure. However, much of the policy energy of the past few years has been devoted to developing a new system for assessing research quality (under the Howard government the chosen instrument was the Research Quality Framework, RQF), which would be used as the

allocation mechanism for a 'substantial' portion of research funds. However, any cursory strategic view of the international research and innovation landscape would suggest that the allocation system in Australia is a second-order issue.

The current Australian allocation system concentrates research funding, based on a formula that takes into account success in winning competitive grants, among a range of other indicators. Rewarding excellence in research is essential to building international research quality. It is one condition of, but not the whole of, building research capability. However, the issue of building research capability is currently being subsumed in a policy debate focused on mechanisms for further concentration of a limited pool of funding.

There is no policy evidence or logic to believe that further concentration of existing research funding will assist in building Australia's research at a rate that will enable Australia to remain internationally competitive. This is in part because much of the funds being dispersed in this way are actually a contribution to the overheads of research already funded via the competitive grants scheme. As the funding of research overheads is insufficient, success required cross-subsidisation from other sources; this in itself is a limit to the extra capacity that can be generated by further concentration. Expansion of the competitively allocated pool of research funds does not enhance research at the rate anticipated if sufficient other funding is not available to support that research.

To summarise the argument, Australia's policy measures are focused on rewarding excellence and concentrating research funding and research training. This is a quality enhancement focus, but it is not the same as building research capacity. We need a policy system that funds research so as to build research capability for the future, as well as providing higher overheads for competitive funding, and thereby rewarding research excellence at a higher rate than is currently the case.

Fundamentally this is an argument for increased funding and rebalancing our current focus on building research quality with a focus on building research capability. In doing so Australia should recognise that quality and overall scale are important. Unlike the UK or Ireland, Australia does not have access to the scale of research investment in the European Union, nor that of the United States.

Investment in research training through the Research Training Scheme (RTS) has remained essentially static since 2001, despite the fact that Australia has an ageing academic and research workforce. And the general research funding to support infrastructure and to allow universities to support the research grants they gain has not grown at the rate necessary to support capability building.

Collaboration with industry

The other crucial aspect of research policy that is designed to build innovation involves collaboration. Do we have an environment that encourages closer collaboration between universities and industry in order to facilitate research and innovation links and knowledge transfer?

There is a key issue here, the balance between public and private good[4] in terms of research policy drivers of collaboration. Linkage grants and the initial Cooperative Research Centre (CRC) scheme worked because the public good of public research funding and effort was married with potential private benefit through returns to industry and potentially to universities through commercialisation of research. The outcomes sought from these funding schemes are not exactly the same as those from peer-driven research funding. The private partners are looking for impact or return to the end-user. The work that has been done through the Australian Technology Network (ATN) Research Quality Framework (RQF) trials on estimating impact would be a useful adjunct to evaluation of the quality and outcomes of funding allocations in this area.

However, if these schemes become too focused too early on private benefit through the creation of companies and the protection of intellectual property within their boundaries, then they will fail to secure the balance essential to collaboration. We can see evidence of this in the recent developments in CRCs, which is leading to reconsideration by universities of engagement. Similarly it has been argued that innovation is stifled if universities are driven to measure success through commercialisation of their research and therefore the strong protection of intellectual property rights rather than keeping a strong focus on their research and the public benefits of its dissemination.

Both the building of research capacity and the building of collaboration would be augmented if there were longer time frames for funded research activity.

Conclusion

Research policy requires a long-term focus in order to ensure that Australia can build innovation so as to take an effective place in the global knowledge economy of the future. We need a five-year funding commitment to building research capacity, a target for increased research higher degree places and a strong funding base for research infrastructure across a range of universities. The reward to excellence should come attached to grants via increasing overhead funding. Support for collaboration should be more strongly focused and evaluated on end-user assessments of impact, rather than heavily focused on capturing the private benefits of that collaboration too early in the innovation process.

Notes

1 Australian Labor Party, *New Directions for Innovation, Competitiveness and Productivity*, ALP, Canberra, April 2007.
2 Department of Education, Science and Training (DEST), *Our Universities: Backing Australia's Future*, Commonwealth of Australia, May 2003.
3 Douglass, John Aubrey, 'The entrepreneurial state and research universities in the United States: Policy and new state-based initiatives', *Higher Education Management and Policy*, 19 (1), 2007, pp. 95–131.
4 Clark, Paul, 'The commercialisation of university research and economic productivity', *Higher Education Management and Policy*, 19 (1), 2007, pp. 133–43.

Chapter 9

Putting research on the policy agenda

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'Other countries are increasing their investment in basic research capacity to attract inwards investment, as well as to capture the broader benefits that flow from university research, including the production of new knowledge, the training of skilled graduates, the development of scientific instruments and techniques, the formation of networks for sharing know-how, and the creation of new businesses … what I am talking about is the need for a new policy setting for Australian higher education.'

Ian Chubb has served as Vice-Chancellor of the Australian National University since 2001, having previously been Vice-Chancellor of Flinders University (1995–2000) and chair of the federal government's Higher Education Council, following a research career in neuroscience and university leadership positions at Wollongong and Monash. The chapter was first presented as a paper on 6 August 2007.

Introduction

Australia cannot afford to go into the second decade of the twenty-first century without a firm commitment to building the knowledge base for the future. Both sides of politics have a duty to address this challenge, and those of us in the university community have a responsibility to help them understand why, and what is required.

In this chapter I want to lay down some markers for research investment as a guide for both the [then] Liberal–National Government and the [then] Labor Opposition.

First, I want to explore the paradox that, while the research performance of Australia's universities is improving, Australia's research capability is slipping behind the world's leaders; that is, the research productivity gains of the last decade or so cannot be sustained under conditions of deteriorating research infrastructure and loss of expertise. Second, in this context I will point, on the one hand, to the widening gap in research performance between Australia's leading universities and the others and, on the other hand, to anomalies in government financing whereby resources for research training are being distributed disproportionately to institutions that perform least well in research. Third, I will outline the essential elements of the necessary renewed investment in research, research training and research infrastructure.

Basic research in the global setting

The context for these remarks in the emerging global knowledge economy is that of rapidly increasing investment in scholarly expertise and research infrastructure by developed and developing countries of the northern hemisphere. By all international comparisons Australia's total investment in research and development lags the world's leaders. With gross expenditure on R&D at 1.8 per cent of GDP, Australia ranks 15th among OECD member countries for which the average is 2.3 per cent. If Australia was investing in R&D at the OECD average rate we would be spending $5 billion more each year than we are currently spending. It is not just the amount of R&D spending that matters but how well it is spent. Nevertheless, we give ourselves a big handicap if the quantum of our R&D inputs is significantly less than that of our competitors; the more so if the distribution and usage of the inputs is less than optimal.

China spent 1.3 per cent of GDP on R&D in 2005 and is aiming for the OECD average by 2020. At the end of 2006 China became the world's second highest investor in R&D, spending some $170 billion, compared with Japan's $160 billion. R&D spending by the EU15[1] totals $290 billion. The US leads with $410 billion. Australia is spending $16 billion—less than a tenth that of China. Australia is also more dependent than other countries on university research. The higher education sector accounts for 18 per cent of R&D for the OECD on average but 27 per cent for Australia.

The Productivity Commission has recently reminded us that 'universities' core role in a national innovation system remains the provision of teaching and the generation of high quality, openly disseminated, basic research'. Australian universities must perform at the highest international standards and, through scholarly exchange, enable the nation to access the world's advances in science and technology. (Parenthetically, I remind you that an important issue that must be addressed is whether all universities in our 'small' country can operate at the highest level, or whether some can; the direction adopted has serious implications for policy, financing and funding.)

Australia conducts 1 per cent of global R&D. Given the relatively free flow of knowledge and data between universities across different nations, research universities provide a key interface through which the global R&D effort can be accessed. But there are issues, as noted by my ANU colleague Professor Steve Dowrick: 'A country like Australia cannot rely on a strategy of passive absorption to maintain strong productivity performance. In order to benefit from the global public good of world knowledge, countries need to have well-trained scientists, a technologically capable workforce and active engagement in cutting-edge research.'[2]

It is the knowledge obtained from basic research that makes practical applications possible. Practical problems can also give rise to basic research questions. A simple linear distinction between basic and applied research cannot be made. Increasingly, international corporations are seeking centres of strong basic research capability as sites for their global investment.

In Australia, basic research represented two-thirds of university R&D spending in 1990–91. By 2004–05 only half of university spending on R&D was directed to basic research. There has been a significant

shift in university spending towards applied research over just 15 years. Australia is pretty much alone in having both business and higher education R&D directed heavily to applied research. It is a big risk for a small country to have such a limited approach, or to let drift happen. While it may be that we cannot yet see the consequences of running down investment in basic research, the danger is that by the time we do it may be too late.

Other countries are increasing their investment in basic research capacity to attract inwards investment, as well as to capture the broader benefits that flow from university research, including the production of new knowledge, the training of skilled graduates, the development of scientific instruments and techniques, the formation of networks for sharing know-how and the creation of new businesses.

International research collaboration

International research collaboration is a rapidly growing component of research activities for all research performing countries. According to a recent study conducted for the UK Office of Science and Innovation, since the late 1990s the volume of international collaborations (as evidenced by co-authored papers) increased on average by 30–50 per cent across the nine countries studied. Cross-national co-authored papers represented 40 per cent of all Australian publications produced between 2001 and 2005, up 31 per cent on the preceding period 1996–2000.[3]

The gap is widening as Europe, North America, China, India and others accelerate their investments in research capability — expertise as well as infrastructure — on a very large scale. Australia too has made selective investments in new platforms to support leading research, for instance in biosciences. However, this country faces the serious risk of becoming a backwater if we squander the opportunity to invest in significant upgrading of domestic research facilities and participate in strategic international research infrastructure partnerships. Here are some examples:

1 The ITER Organisation for fusion R&D has seven members: the European Union, Japan, the People's Republic of China, India, the Republic of Korea, the Russian Federation and the USA. The construction of ITER, at Cadarache in southern France, is estimated to cost 5 billion Euro ($8.4 billion) over ten years.

2 The Large Hadron Collider (LHC) at CERN, Switzerland, which began operation in May 2008, will be the world's largest and highest energy particle accelerator. The LHC is being funded and built in collaboration with more than 2000 physicists from 34 countries, universities and laboratories.

3 The International Space Station being assembled in low Earth orbit will complete 15.7 orbits per day. The ISS is a joint project between the space agencies of the US, Russia, Japan, Canada and several European countries.

4 The Galileo global network of 30 satellites provides precise timing and location information to users on the ground and in the air. Costing 3.4 billion Euros of public and private investment, it represents the biggest space project yet undertaken in Europe.

5 Project Constellation is a NASA program to create a new generation of spacecraft capable of performing a variety of missions, from Space Station resupply to lunar landings. In response to data indicating that US research competitiveness was slipping against world comparators, the US Budget for the 2008 financial year has doubled over the next ten years the amount of funding for the National Science Foundation, the Department of Energy's Office of Science and the Department of Commerce's National Institutes of Standards and Technology. For the National Science Foundation alone the Budget provides $US6.43 billion 'to energize the nation's leadership in fundamental research and education'.[4] Priority is being given to discovery research for innovation. Because the most fertile ground for discovery is often to be found at the interface of different disciplines, the decision has been taken to keep all disciplinary fields healthy and strong while providing for new and emerging fields that have the potential to overturn accepted paradigms. Concurrently, the NSF is investing in international partnerships with research communities around the globe 'to detect movements at the frontier and capitalize on new concepts', in a set of initiatives to prepare the next generation scientific workforce, and in cyber-enabling systems and tools for managing the vast amounts of data that can be generated.

Australia's performance

Where is the Australian equivalent in understanding the imperative to join the world's strength in research and committing the resources needed to do so?

We need to replenish the supply of new researchers as the academic workforce is ageing. Career options are uncertain for early- and mid-career researchers who depend largely on grants for short-term research projects, typically three years in the case of ARC grants, three to four years for NHMRC grants, and even shorter grants for industry-funded and contract research. Too many talented researchers, who could form the base for the next generation of Australia's research capability, are being lost to the system. Australia cannot afford to be so narrow and mean-spirited about developing the next generation of intellectual leaders. There is a high-end skills shortage emerging that will cost the country dearly as the global knowledge economy expands.

Australia is producing only 2.3 new doctorates per hundred university graduates, compared with 3.9 in Canada, 10.1 in Switzerland and 11.2 in Germany. And we are falling further and further behind. There has been no growth in the number of research training places since 1999, when some 21,500 places were funded. In 1994 there were 10,258 higher degree by research (HDR) commencing students, of whom 14 per cent were international students. In 2005 the total number of HDR commencers had risen to 11,008, of whom 21 per cent were international students. The actual number of domestic HDR commencers fell by 2 per cent over the period.

The available evidence suggests that the performance of Australia's university sector has made substantial productivity gains over the last decade or so. Teaching productivity has increased, as indicated by higher student:staff ratios, higher rates of student completion and increased levels of student satisfaction. Meanwhile the level of public funding per student has eroded. The overall effect has been a sizeable return on the public investment, notwithstanding concerns within the sector about aspects of the student learning experience as well as staff workloads.

Research productivity has also risen sharply. The volume of research output has increased, as has output per researcher, and,

contrary to a view in some circles, the indications are that the quality of the greater output has improved. Let me illustrate this.

If we look at the HERDC data reported by universities annually to DEST, we see weighted publications increasing by 188 per cent, from 15,191 in 1995 to 43,853 in 2005. On this measure, total research output per academic staff FTE has risen from 0.5 publication units to 1.3 publication units over the decade. If we take Thomson ISI publications over the two five-year periods 1995–99 and 2001–05, we also find a substantial although lesser increase of 28 per cent, from 82,164 to 104,922.

Diverse outputs and skewed funding distributions

There are significant differences in research performance among universities, as there are within universities by field of research. Clearly, within universities like Wollongong, Griffith, James Cook or Flinders there are fields of research that are among the best performing in the country, and it is important that these strengths not be diminished.

The differences in the scale of output growth are very interesting. The Go8 universities increased their share of total output from 25 per cent in 1995 to more than 50 per cent in 2005, notwithstanding high percentage rates of growth off a low base in the smaller research institutions. The performance gap in volume terms is widening, despite a considerable diversion of effort in favour of research activity across the sector, much of it funded through cross-subsidisation from teaching activities that are themselves subject to squeeze.

It is important to note that the quality of output, as measured by citations per publication, has been improving throughout most of the sector. Here we are looking at the university sector as a whole. Within the aggregates will be found different areas of strength by field of research, with some universities being more comprehensive in their strengths than others.

The most significant point is that despite the improvement in Australia's overall research productivity, only ten universities are performing above the world average for citation impact in 2001–05.[5] These are the Go8 universities plus Swinburne and Charles Darwin. The latter are smaller institutions with focus on a few fields, and they do very well in at least one field. Swinburne, for instance, wisely

concentrates on five of the (Thomson) fields of research and performs on a par with the world average in three fields, is below on one, and is well above on one other with an outstanding performance in astrophysics and supercomputing. By contrast, ANU has a broader research orientation, performing in 24 of the Thomson-ISI fields of knowledge.[6] ANU performs well above the world average in 18 of those fields and is on par in four others.

When we put output volume alongside output quality we see a significant gap between the leading eight and others. We can also see broadly four types of institution in terms of research performance: (1) those that are comprehensively strong, albeit with some areas of relative weakness; (2) those that have focused niche strengths; (3) those that are comprehensive but have strengths in only a few areas such that their overall performance falls below world average; and (4) those that are comprehensively weak.

Now let us look at the distribution of public resources for research, research infrastructure and research training. In 2005 research income from national competitive, peer-reviewed grants totalled some $625 million, of which Go8 universities obtained a share of 74 per cent. The Go8 also shared 74 per cent of Research Infrastructure Block Grant (RIBG) funding. However, in the same year, Go8 universities received only 64 per cent of Institutional Grant Scheme (IGS) funding and 60 per cent of Research Training Scheme (RTS) funding. In the case of the international research scholarships (Endeavour IPRS) the Go8 share was, puzzlingly, less than 60 per cent.

Through the RIBG scheme, the scheme directly linked to competitive grant success, universities received on average 21.6 cents for every dollar of competitive research income. The Go8 universities happened to get exactly the average, 21.6 cents.

Through the IGS (distributed according to the formula 10 per cent publications, 60 per cent research income total and 30 per cent HDR load) universities overall received on average 34 cents per dollar of competitive research income. However, 14 universities received in excess of 60 cents per dollar, the top four among them being the University of the Sunshine Coast ($1.06), Southern Cross University (98c), Central Queensland (90c) and Edith Cowan (87c). All Go8 universities received less than 34 cents. Clearly, if IGS is to be linked to research quality, the formula needs to be changed.

Through the RTS, universities received on average 65 cents for every dollar of competitive research income. However, all the Go8 universities received less than 60 cents, with ANU getting merely 33 cents. Seventeen universities received more than $1, with Sunshine Coast, Southern Cross, Central Queensland and Edith Cowan getting more than $2. Sunshine Coast won $176,000 in research grants but received $696,000 for higher research degree places. Southern Cross received more than $3 million from the government for research training places whereas it won $1.4 million in research grants.

I think it is valid to compare funding for research training with success in the national competition for research funding primarily through the ARC and NHMRC. Through those mechanisms the available funds are allocated to those researchers who are deemed by their peers to be the most meritorious. It would be hard to sustain the proposition that quality research training can be provided in the absence of quality research. It is true that it does not automatically follow that, in every quality research environment, quality research training is provided (we all know a horror story or two). But the point is that you will simply not find a quality research culture in an institution whose researchers are not competitive nationally, let alone internationally.

So what explains the inverse relationship between research performance and HDR places? The RTS formula has three elements: student completions (50 per cent), research income (40 per cent) and publications (10 per cent). Annual changes in allocations through the formula are buffered through caps on winnings and safety nets against losses. These buffers result in disconnections between shifts in performance and funding.

Attention has focused on the publications factor as a diluting influence on the allocation of RTS funds, but the data I am using suggest those concerns are overstated. Similarly, research income is not the problematic element of the formula. If funds for PhD places were allocated in proportion to all research income, then the strongest performing universities would have received $44 million more in 2005. If funds for research training places were allocated on the same basis as RIBG, the strongest performing research universities would receive $75 million more than they currently receive through the RTS. That leaves the most highly weighted element—HDR enrolments and

completions. A number of universities appear to have larger HDR enrolments and rates of HDR growth than their research performance would predict. It seems a few with less distinguished research track records are drawing disproportionately from the international student market, perhaps to increase their completions count for the RTS formula. Growth in international HDR commencements does not appear to correlate well with strength in research.

Not only are we dissipating the shrinking investment by skewing the allocation of scarce domestic resources away from our performance peaks but also we are allowing signals to be sent to the world about Brand Australia through PhD offerings that might not withstand basic scrutiny. Are all PhDs of the same standard? It is not remotely possible that they are. The problem here is not just the formula but also the policy mindset it reflects, a view of a 'fair average system' with 'parity of esteem' of degrees, rather than the reality of a sector having diverse institutional characteristics and differentiated quality.

I am not suggesting and would not suggest that resources should be taken away from any university. Indeed, I would argue the opposite. Fund properly what we do, and what we need to do, to keep Australia competitive. The problem is that we fall into policy traps. One is the notion of 'Brand Australia' and the implication that standards and quality are common throughout the sector, if not identical. Another is the focus on whether funding is appropriately allocated, which fuels the notion that the quantum of funding is acceptable (although it is not) and that it is only its distribution that is a concern.

In the absence of adequate national investment in higher education and research, and given policy incentives encouraging all universities to dance to the same tune and chase the same few discretionary dollars, a number of institutions are distorting their missions and eroding their effectiveness, without matching up or catching up in the competitive world of research. And simultaneously we reduce the capacity of the higher performers. We have to be mature enough to recognise the fact that some will never catch up, and we should not spend scarce resources in the false belief that it can happen. The rest of the world is not waiting for Australia to catch up, and if our leading universities fall behind, because we persist in diverting resources away from sustaining our strengths, while we

build on them and others, then Australia will pay a high cost into the future.

It would be much better to permit universities to direct their use of the available resources to what each can do best. That means expanding institutional flexibility and discretion, and in many ways that means government getting out of the way and reducing the counterproductive controls its exercises at the micro-operational level. Above all it means government recognising its responsibility for helping to build competitive research capability through adequate and appropriate investment.

Future priorities in research

So I come to the future investment priorities for research, the basis for a BAA3 (Backing Australia's Ability 3 program of research grants) or its equivalent.

The top priority is research infrastructure. While people are the most important factor, we cannot attract the people we need if we cannot offer them at least reasonable conditions for undertaking research. We are losing talent overseas frequently because others are providing research infrastructure of capacity and quality we cannot match. It is true that in several areas of research in a number of Australian institutions the research fabric is state of the art. However, throughout the sector there are serious deficiencies in the capital stock, in buildings that are decaying and do not comply with contemporary building standards and regulatory requirements for the conduct of research, and in the water and sewerage, gas and electricity and communications infrastructure. The backlog maintenance costs for the Go8 universities alone leaves little change from the whole of the Higher Education Endowment Fund. Additionally, there are many areas where scientific equipment has been band-aided together from bits and pieces collected from various sources of research income over time. In too many areas it is embarrassing to have international visitors in our laboratories.

The second priority is to attract more students into doctoral programs and develop the next generation of researchers. That involves expanding the number of HDR places with stipends, and not only for Australian students but also for international students to study in Australia. It also involves expanding programs for the

development of early- and mid-career researchers. Above all, it involves ensuring quality in research training.

The third priority is to increase funding for basic research. That involves providing a higher level of funding on a block-funded basis for longer-term research, rather than short-term instrumental research. We must be strategic in our approach.

The fourth priority is to increase the proportion of research costs covered by competitive research grants. Currently ARC grants on average cover only 70 per cent of the costs—and there is inadequate support for the additional indirect costs. Australia currently puts a price on success, as we cross-subsidise our successes from other activities.

The fifth priority is to develop funding programs to enable international research collaboration through shared infrastructure investments, researcher exchanges and collaborative research projects.

Finally, there is a great need to fill a gap in the innovation system by expanding access to proof of concept funding. This was a major gap identified by the National Innovation Summit seven years ago, and it remains a major gap.

Conclusion

We need a new policy setting for Australian higher education. We can argue for ever that Dawkins did this or Dawkins did that. Twenty years ago he did, indeed, do something. And there is no point in lamenting what he did, and what we are.

Nor is there much value in arguing that we should let it run plus occasional tinkering for another 20 or more years so that 'the others' can catch up. It is an unlikely outcome; and there would be only one near certainty: we would have to settle for something less than fair average quality as we level down in the hunt for equality.

If we had a policy setting that made the best use of the institutions as they have developed; if we encouraged the differences between those institutions, and if we accepted that there will be different costs in being different; if we funded quality outcomes, wherever they might be found; if we focused more on real outcomes and less on process, and even less on the easily measurable, therefore using our judgement and eschewing minutiae, then we might get somewhere.

And if it is policy that is genuinely in the national interest, policy that occupies the high ground, so high indeed as to be above the politics because it is that important, then Australia might well be able to keep up with what the 1946 founders of the Australian National University were then able to call the 'enlightened nations' of the world.

Notes

1 EU15 refers to 15 member countries of the European Union before May 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
2 Dowrick, S., 'A review of the evidence on science, R&D and productivity', paper prepared for the Department of Education, Science and Training, Canberra, 2003.
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4 Bement, Jr, Dr A., Director, National Science Foundation, Testimony before the Senate Commerce, Science and Transportation Subcommittee on Technology, Innovation and Competitiveness, 19 April 2007.
5 Citation is the process of acknowledging or citing the author, year, title and locus of publication (journal, book or other) of a source used in a published work. 'Citation impact' is a composite measure derived from the number of times that all journal articles for a field of knowledge, or articles from a particular country, are cited in other articles.
6 Thomson-Reuters ISI Web of Knowledge, at: http://www.isiwebofknowledge.com (accessed: 29 October 2008).

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