



**LET'S TALK  
TECHNOLOGY  
FOR EDUCATION**

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# STARTING A CONVERSATION

**Rarely have education systems' performance been as scrutinised and funding and policy options so vigorously debated as over the past few years. Education performance is now on the global stage, underpinning achievement of broader economic and social objectives. For Australia in particular, improving education performance is a key strategy in reversing our decline in productivity and setting us on track to take advantage of the major structural shifts in the global economy.**

But while the community, business and education sectors have welcomed the heightened profile of education, Australian governments now face a challenging paradox: the need to respond to significantly expanded expectations and new structural imperatives whilst the fiscal environment is increasingly uncertain and constrained.

Today, most advanced nations are confronting fiscal dilemmas which produce significant resource pressures on the public sector. Australia may not be in as difficult a position as other countries but some anticipate the fiscal challenge will last for another decade. Nevertheless, while fiscal constraints mean many areas of public policy and delivery are being challenged to improve without the usual budgetary stimulus, they also throw up options

for circuit-breaking change and a transformation in the ways of doing business.

Alongside lightning fast changes in information and communication technologies and the ever present potential for technologies to 'disrupt' and transform the traditional public sector landscape, the education sector is increasingly engaged in fresh thinking that challenges business-as-usual. There is now an opportunity for education leaders to apply breakthrough technology to support breakthrough thinking.

Optus is seeking a conversation with you on your priorities and how our business can better meet your needs.

Optus is seeking to work more closely with Australian education systems to better understand your priorities and to support you in finding solutions to key challenges.

We have started this process by gathering views in late 2013 on current education priorities and solutions from Australian education systems. This initial overview paper is intended as stimulus for a discussion on those trends.

We welcome a conversation with you on these priorities throughout 2014.

**A conversation lead by:  
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# WHAT'S CHANGED AND CHANGING?

**Australia's capacity to continue to be globally competitive and ensure the benefits not only grow but are fairly distributed increasingly depends on meeting demand for high level skills. We need outstanding capability at all levels – not only in our tertiary education system but also an equitable spread of high quality schooling outcomes as the foundation for working in the global economy and living in a global and interconnected society.**

## REACHING THE TOP TIER

All school education strategies around the country aspire to lift Australia's educational performance to be among the best in the world for its quality and equity. But international assessments of student performance reveal how hard it is to reach top tier status globally.

At a 'big picture' global level, the Organisation for Economic Cooperation and Development (OECD) rankings of learning achievement through the Program for International Student Assessment results (PISA) now conducted across 65 countries has considerable resonance with the community and with those setting education objectives.

The 2012 PISA test results for reading, science and mathematics show that Australian education is going backwards on the global scale – a declining trend over the past decade since the test began in 2000.<sup>1</sup>

Australia still performs above average for developed countries, but while Australian education was once in the top group in all three disciplines, it has regressed. Along with the USA, UK and even Finland, Australia is slipping back whereas our East Asian neighbours are now the dominant top tier of performers. For example, when compared to an average Australian 15 year old, an average 15 year old student from Shanghai is nearly two years ahead in science, and a year and a half ahead in mathematics.

While there are many contextual factors that complicate an interpretation of these comparative results, we do know that for Australia the higher the level of socioeconomic background, the higher the level of students'

performance. Family circumstances and the composition of the school still have a disturbingly significant impact on educational outcomes. Without breaking that pattern we cannot compete with the best. To get to the top tier Australia has not only to strive for improved outcomes for all but we must close the gap between the top and bottom performers.

## EXPANDING SKILLS AND FLEXIBILITY

The global performance challenges may not be as stark for the Higher Education and Vocational Education and Training (VET) sectors as for the school sector but they are as complex. The global economy requires Australia to continue to develop a labour force with a range of mid-level trade, technical and professional skills alongside the higher level skills gained from Higher Education. While a highly skilled and flexible labour force is a priority results to date are mixed.<sup>2</sup>

The good news is that Australia ranks ninth in the OECD on people with tertiary level qualifications at 38.3 percent, well above the OECD average of 32.7 percent (Canada is first) but below the OECD average for 20-24 year olds currently participating in education (OECD at 44.2 percent; Australia at 42.1 percent).

While Australia is progressing in terms of increased proportion of working age people holding post-school qualifications (54.2 percent, up from 48.3 percent in 2006), more people completing VET courses at a higher level, and the qualification levels increasing for disadvantaged groups, we are falling behind in other areas. Too many working age adults still have low level literacy and numeracy skills. This is far too many compared with the



OECD average, and we will struggle to meet our national target in 2020 for reducing the proportion of people without post-school qualifications.

For the Higher Education and VET sectors, global competition is tangible; Australia is one of the leading providers in the world of international education and will need to compete successfully to hold that position. Whether in Australia or through off-shore campuses, education and training services generate around \$15 billion of export income annually. The consensus is that international education is about to face significant challenges from competitors, particularly Asian institutions.

Australia's capacity to meet accelerating global demand for education cannot be presumed to be adequate without a strategy to build and sustain quality, meet the demands of globally minded students, develop partnerships and manage costs.<sup>3</sup>

## EDUCATION AS INVESTMENT

The recent 'Gonski review'<sup>4</sup> of schooling, although not universally endorsed, galvanised consensus around the notion that Australia should strive for education excellence and that funding for schooling must not be seen simply as a financial matter. Rather, it is about investing in Australia's future. Every school must be appropriately resourced to support every child and every teacher must expect the best of all students.

A consensus is emerging that fresh thinking is required to meet these challenges and transform how education can deliver outstanding results. Judicious investment is the best lever for change: incremental improvement will not be adequate to the task.

But while the commitment to reform and a sense of urgency is widespread, there are many uncertainties about how to boost performance, particularly in the school sector, how to best allocate funds and which technologies to support. The national and global evidence base of 'what works' is expanding but factors contributing to success of education systems, like other areas of social policy, are not precise and not easily differentiated.

Faced with scarce resources, all systems are engaged in identifying the main leverage points that will deliver the big steps in improvement. This includes looking for the 'game-changers' in technology that can transform delivery and boost outcomes, but this is exactly where leaders are most wary given past technology implementation shortfalls.

Australia was formerly a leader in education policy with exemplary outcomes for young people – the Higher Education Contribution Scheme, a national scheme with industry for determining VET priorities, early years' literacy, and the early application of information and communication technologies in classrooms are just some of the areas of past leadership. Education systems and institutions want to see Australian education regain that leadership position.

## BREAKTHROUGH THINKING

According to the OECD, those countries that have achieved significantly higher levels of economic and social performance did so by explicitly designing and implementing multi-year public policy reforms that push beyond everyday initiatives.<sup>5</sup>

They select the right levers to use for improvement; focus on a small number of key elements; deploy them in concert, and build capacity to implement; persist over time; and monitor and learn as they go in relation to actual results and effective practices.

With infinite interconnectivity as the future, the search for new delivery models, analytical and research techniques, professional capacity building, streamlined administration, knowledge management and so on is growing in intensity across education as in other sectors in the economy. Topics such as collaborative networks, cross sector partnerships, distributed leadership, blended learning, less red-tape, more innovation and less risk aversion are pervasive.

A snapshot of nine high level priorities for strategies to improve Australian education is described below.<sup>6</sup> These have been drawn from discussions with leaders and experts in Australian education and a fuller account of these priorities follows in the next section. Some are focused on old problems requiring new solutions; and some new 21st Century challenges have emerged. All need breakthrough thinking to drive sustainable solutions.

<sup>1</sup>Bortoli, L., Buckley, S., and Thomson, S., (2013), Programme for International Student Assessment (PISA) 2012: How Australia measures up, Australian Council for Educational Research, Melbourne.  
<sup>2</sup>COAG Reform Council, (2013). Skills in Australia, Five years of Performance, Report to the Council of Australian Governments, Canberra. <sup>3</sup>Department of Industry, Innovation, Science, Research and Tertiary Education, (2013). Australia – Educating Globally: Advice from the International Education Advisory Council, February, Canberra. <sup>4</sup>Australian Government, (2011). Review of Funding for Schooling, Final Report, December, Canberra. <sup>5</sup>Organisation for Economic Cooperation and Development, (2010). Making Reform Happen: Lessons from OECD Countries, Paris. <sup>6</sup>These priorities have been identified for discussion following interviews with a range of education leaders in November and December 2013 and desktop review of jurisdictions' strategies and policies. These discussions are ongoing in 2014.

# A SNAPSHOT OF PRIORITIES

## SYSTEMIC RENEWAL

More than just incremental improvement

## PRODUCTIVITY

Higher expectations for social and economic returns on investment

## FOCUS ON LEARNING

Modernising the core business of education

## AUTONOMY

New authorities and accountabilities between systems and institutions

## LEADERSHIP

Major boost to capacity; instructional leaders with system focus; better use of management levers

## TEACHING PRACTICES

Emergence of evidence-based and blended instruction

## NEW DELIVERY MODES

Partnerships; new governance; collaborative enterprises

## TEACHING QUALITY

Pivotal factor, improvements along the professional life cycle; applies all sectors

## 21ST CENTURY CURRICULUM

Building the skills, knowledge and attitudes for global awareness and engagement

## EXTENDING SUCCESS

Fixing the problems of high and unacceptable variation in access and outcomes for all

## LEVERAGE WHAT WORKS

More with less and at scale; delivery models/providers contestable – who can do it best; joined up services

## NEW METRICS

For system effectiveness, teaching impact and real time assessment of 21st century outcomes for learners

WHAT IS THE ROLE OF TECHNOLOGY? DON'T ASK HOW TO APPLY TECHNOLOGY;  
ASK WHAT TECHNOLOGY WOULD BEST HELP US TRANSFORM OUR WORK.

# WORKING ON THE PRIORITY LIST

## SYSTEMIC RENEWAL: MORE THAN JUST INCREMENTAL IMPROVEMENT

Governments, systems and schools are no longer satisfied with school by school or institution by institution incremental improvement or business-as-usual. The contemporary challenge is to transform whole education systems and lift all-round performance for excelling in the decades ahead.

The primary role of education departments around the country is changing accordingly; systems have to learn what this means for them. One department refers to its role as a 'system architect', stepping back and finding and shaping the right levers for change; and being the 'manager of system performance'— knowing what matters to monitor, evaluate and feedback to providers.

But education leaders know that in the 21st Century Australian environment, this is not done through more red-tape or 'command and control' tools. Terms being used by systems are 'empowerment', 'autonomy', 'independence' 'devolution', 'transparency' and 'alignment' to explain how a new balance is being struck between roles, responsibilities and accountabilities for all players in a system for achieving excellent outcomes in a fiscally constrained environment.

Three major strands of activity are:

### AUTONOMY

This is a major but complex change agenda for government school systems in particular, but also for VET systems in those locations where local autonomy has not already been established. It calls for higher expectations and more trust in schools and institutions to design their own strategies, including managing expenditure, combined with taking greater responsibility for outcomes. This requires smarter performance accountability but without losing system knowledge and the capacity to intervene for struggling or failing institutions. It calls for new leadership and management skills at the local level. As one system leader said, 'We don't want to lose the benefits of being a system but we want the gains from more local decision making and responsibility'.

### NEW DELIVERY MODES: PARTNERSHIPS, NETWORKS AND NEW GOVERNANCE

An aspiration in most systems is that schools, Early Childhood Education, VET and Higher Education are aligned and geared to the learning and development needs and pathways for learners. Systems are striving for institutions to be locally connected – with 'a self-improving system to deliver a rich and seamless education'. This might involve new coalitions not only among conventional education institutions but also not-for-profits, business and other government services, often in a new market. Importantly, systems are striving to remove entrenched institutional barriers, calling for new levels of professionalism, enhanced skills in communication, collaboration and negotiation.

### EXTENDING SUCCESS

National and international test results show us that Australia has unacceptably widespread differences in performance that correspond to social and economic disadvantage. If we want to move into the top tier, systems know they have to successfully tackle the intractable problem of the effects of disadvantage on performance, whether that is our Indigenous children and young people, those in rural locations or those in families of long term unemployment. This is also a moral challenge. We also need to extend performance at the top end in order to allow all students to reach their full potential. It calls for new and flexible models of access to all levels of education, new roles for teachers and others in supporting new entrants, and new community partners.

#### How can technology support system renewal?

- Administrative solutions - whether to use cloud services
- Boundary crossing collaborative tools - web/videoconferencing
- Greater data availability - performance analysis, real time evaluation for system learning
- Tracking learner progress - mobile learning and adaptive tools for customisation

#### What would be a game-changer?

- If only we could...

## PRODUCTIVITY: HIGHER EXPECTATIONS FOR SOCIAL AND ECONOMIC RETURNS ON INVESTMENT

Governments and the community are now expecting more economic and social returns on education investment. Government budgets are constrained, and will possibly be so for the coming decade. Investment needs to be in those capabilities that are essential for success and in the technologies that make a difference. As the pressure for change will continue, innovation becomes a critical capability.

The centerpiece of all successful whole system reform and productivity improvement is a blend of evidence based capacity building, relentless focus on implementation and, according to some education leaders, the courage to challenge what we take for granted. As one leader explained 'in our system we are taking a fresh look at everything we do; we have an ambitious reform agenda'.

Three major strands of activity are :

### LEADERSHIP CAPACITY

Building leadership capacity is, on the surface, a relatively mature agenda in many jurisdictions. Leadership strongly influences outcomes whether at the micro level of schools and institutions or at the system level. It is however becoming more demanding as leaders are increasingly responsible for 'leading learning', building new coalitions in the community, managing complex trade-offs and negotiations and for developing a smart and innovative workforce.

### TEACHING QUALITY

The argument for improving the quality of learning and teaching at all levels of the education system is accepted globally as well as around Australia. Boosting teacher quality and professionalism in schools is a particular feature of the change agenda in most jurisdictions. Strategies are comprehensive - reform of entry requirements and pre service teacher education, performance and development systems for supporting teachers in their careers, and innovations in boosting the composition of the workforce. But transforming a workforce of several hundred thousand is long term and a challenging agenda.

### LEVERAGE WHAT WORKS

Systems and institutions need the analytical capacity to know more about who is succeeding and why; how to monitor and sustain a reform focus and implementation; and what levers for change are working best. They are exploring fresh solutions for vexing problems, for example, engaging families in new ways in the early childhood area. Education systems are large and complex. They need to ask new questions, access 'big data' and have the capacity to interpret it and apply what they learn.

#### How can technology support improve productivity?

- On line professional learning, peer observation and feedback loops
- 'Big data' system analysis - data mining and diagnostics
- System learning management platforms - network systems that work
- Interactive communication e.g. with families about children's' development needs

#### What would be a game-changer?

- If only we could...



## FOCUS ON LEARNING: MODERNISING THE CORE BUSINESS OF EDUCATION

Focus on Learning: modernising the core business of education

The pendulum has swung back to a resolute focus on learning as the core business of education. This sounds obvious but it is having a powerful impact. It requires not only knowing more about how learning occurs, including the neuroscience, but also knowing how to challenge and enthuse children and young people at all stages in their education and training so as to prepare them to work and live in the globalised Asian century.

Learners at all levels do not want a fundamentally passive way of learning; an interconnected world requires, and makes available, more and more active processing of information and a constant cycle of innovation and adaptation.

Harnessing technology for teaching and learning is an objective around the country but all concede that its application is patchy and many are now wary of major expenditure on single solutions.

Pointers to the next steps in technology to support teaching and learning are at the same time very encouraging but increasingly hard to read. There are major inroads to be made into Early Childhood Education but where is investment best made? Some Australian schools lead the world in their use of technology in learning but why do so many lag? Advancements in Higher Education through MOOCs and the like are challenging conventional institutional structures but their role and business model are far from settled; learners are increasingly demanding high quality 'tech savvy' learning experiences that match their daily lives but how does a system manage security, privacy and the technical diversity from BYOD?

Three major strands of activity are:

### TEACHING PRACTICES

The search is on to support teachers in understanding the 'black box' between their teaching inputs and educational outcomes; that is, what teaching practices work and why? A number of systems are now using the 'big data' that are available from national and international testing to delve into the practices that work. Smart learning management systems are being developed at local levels to support teachers to monitor and share their work. This can enable teaching to break out of the conventional classroom teaching models and embrace evidence based teaching practices that are far more differentiated and customised to students' achievements, interests and dispositions.

### CURRICULUM FOR 21ST CENTURY

The old industrial era model simply doesn't fit our changing needs. The opportunities to revolutionise the source and nature of curriculum are immense – re emphasis on some subject areas such as languages; revisiting ways of teaching for literacy and numeracy; blending traditional and new knowledge with an international perspective, particularly Asian; and a fresh emphasis on skills for new ways of working, problem solving and relating are some themes under discussion.

### NEW METRICS

The next wave in measurement and assessment is beginning. In schools, assessment is not only about the key priorities of literacy and numeracy but also assessment beyond NAPLAN and beyond Higher School Certificates. The search is for new metrics for learning, engagement and development. Next generation learning is when there is personalised feedback, with close alignment between content and assessment so that students receive instruction specifically tailored to their needs and interests. This facilitates self-directed and individualised learning. Systems are also looking for feedback on their performance in delivering 21st Century learning outcomes. So the 'new metrics' apply not only to the classroom and a better understanding of learners' achievements and teachers' practices, but also to education systems and individual institutions being able to analyse and understand the impact of their policies and practices.

#### How can technology support a focus on learning?

- Online and blended learning
- 1:1, BYOD
- Student analytics
- Blog spaces, apps
- E-portfolios; adaptive assessment
- Design Centres - CAD and 3D printing
- Gamification
- New learning spaces

#### What would be a game-changer?

- If only we could...



# NEW LENSES FOR TECHNOLOGY IN EDUCATION

WHAT IS MAKING INROADS INTO OTHER  
SECTORS THAT COULD OFFER NEW  
OPPORTUNITIES FOR EDUCATION?

## DATA → INFORMATION → INFO GRAPHICS

What we can find out has expanded; the concept of data as we know it has expanded. New data might be geo location; activity rates; performance levels; time on task; preferred learning styles; and preferred tools and applications. The new data can be pulled together in new ways; we can have fuller answers to new questions – how do young people prefer to learn; and where do they learn?

But the more information, the harder it is to interpret. Info graphics enables information to be more 'digestible'; visual forms to engage with; we want our information to mean something.

## INTERACTIVE

Devices are no longer for consumption alone but also for production and co-creation; our knowledge is not just through static websites but through applications on any device.

We can ask new questions and produce new responses, irrespective of where we are. Through mobile computing devices, high-speed wireless connectivity, and applications teachers and learners can collaborate on line, video conference, share websites, and monitor their own and others' activity.

## THE INTERNET OF THINGS

This enables a merger of the physical and digital worlds; computers are now able to receive data from almost any kind of physical object, enabling us to monitor the performance of machines, objects, land, and even people. This has vast potential in agriculture, manufacturing, traffic in cities and personal health. But, it is new territory, even for those with a high degree of technical expertise.

While there is a long list of issues to resolve to protect the rights and privacy of citizens, at the very least, the Internet of Things opens up unprecedented exciting teaching and learning opportunities across the curriculum in all sectors. Tools that were available only for high level researchers could be available for children and young people for their day-to-day learning.

## CLOUD AND MOBILITY

Device type and location are no longer limitations. Cloud allows us to access a single point – a shared document, spreadsheet or social network from all our devices, wherever we access our files.

The Cloud is giving us greater simplicity in storage and access, changing the relationship between central bureaucracies and their systems and among members of a network.

And there is potentially no limitation on the mobile Internet with highly flexible and accessible devices, creating entirely new education and training arrangements. Today, smartphones and tablets are the devices used to access the mobile Internet, but new forms are constantly emerging. In coming years, mobile Internet devices could well be smaller, far more powerful, more intuitive, wearable, and packed with many types of sensors.

## E-RESEARCH

E-research is maximising benefits from sharing the research effort, especially to enable computers to do what they do well – tackle complicated, analytical needle-in-a-haystack problems, and with perfect memory. The medical research model has globally linked super computers to collaboratively research big questions like genome mapping and opened brand new avenues for innovative problem solving.

It enables research to move from the often competitive and isolated laboratory realm to one that is exciting, iterative, collaborative, immediate and globally owned.

We need to know how education research can benefit from collaborating on advanced computational and analytic capabilities.

# GIVE US A CALL

To discuss how Optus can help you through innovative communications solutions; **contact your Optus Account Manager or call the Optus Business hotline on 1800 555 937**

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