



Australian Government

Chief Scientist

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The universities of 2030

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The old story

There is a very well-known story about higher education. And it goes like this.

One thousand years ago, or thereabouts, some people got together. We called them “teachers”.

They attracted some other people. We called them “students”.

The first group delivered lectures to the second group. We called this “education”.

The first group persuaded monarchs and popes to let them engage in this process under a formal mandate. We now had “universities.”

And pretty much nothing has changed ever since, except the costumes and the scenery. (And of course the popes.)

A thousand years later, the model is clearly under strain. And we are clearly the generation to put it right.

Now here the story splits into a number of alternative visions for 2030:

One: universities end, because technologies kill them.

Two: education ends, because robots take all the jobs.

Three: the world ends, because we destroy it, if the robots don't take the initiative first.

And of course, the fourth alternative (and the most likely story ending): universities do what they have always done, which is to evolve to incorporate modern technologies and pedagogies, the question being how quickly and efficiently they get there.

Take your pick... and welcome to 2030!

A human future

At this point I need to confess. I was once a signed-up member of the Doomsday Club. I envisaged teachers replaced by super-intelligent software. Bricks-and-mortar universities replaced by virtual worlds. An oligopoly of online degree providers: like a Presto, Stan and Netflix for education. Princeton, Stanford, Cambridge?

Oh, sure, there would still be a few physical campuses... here and there. But think how much prime inner city land we'd free up when most of the campuses are gone! And the few left standing would be ultra-exclusive boutiques, for the hopeless romantics still pining for the medieval ways.

It was elegant argument based on good engineering logic.

Then I became a Chancellor of a university. Simultaneously, through other channels, I actually had a go at developing some education programs myself.

It turns out that humans are a lot messier than engineering logic sometimes implies.

So I recant. Or rather, I recalibrate.

I still hold absolutely to the conviction that change is here, it is accelerating and its impact will be profound. But it is human institutions and expectations that will decide what the university becomes.

So let me outline the factors I see in play on the path to 2030.

First – the demography.

By 2030 the world will have more people: the global population will grow by 1 billion. More prosperous people: the global middle class will double to 4.9 billion. And a more diverse middle class: the majority will come from China, India and South East Asia.¹

The global market for higher education is booming, and shifting.

Second – the labour market.

More than 5 million Australian jobs – close to 40 per cent of the jobs we do today – are likely to be capable of automation by 2030.² Low-skilled workers will be hit fastest, and hardest - but professional jobs are far from immune.

You can already get financial advice, a medical diagnosis and a prize-winning novel without human involvement. (At least you can in Japan.)

The more expensive the human worker, the greater the incentive to automate the job.

On some predictions I have seen, by 2035 – when our 2030 entrants might be graduating – unemployment could hover somewhere around 45 per cent.

In that scenario, 30 per cent of adults hold jobs requiring a high degree of physical dexterity. That leaves 25 per cent in the so-called professional roles – for which the competition would be global, and intense.

¹ See RAND Corporation, *The rise of a global middle class: Global societal trends to 2030*, 2015. Available: http://www.rand.org/content/dam/rand/pubs/research_reports/RR900/RR920z6/RAND_RR920z6.pdf.

² See Committee for Economic Development of Australia, *Australia's Future Workforce?* June 2015. Available: <http://www.ceda.com.au/research-and-policy/policy-priorities/workforce>.

Regardless of the faith we invest in those numbers, it is surely clear that automation means the imperative to get an education will grow. For some, because they want to work. For some, because they need to retrain. For others, because they simply need a way to occupy their time.

Third – the social expectation.

Right up to the present, higher education was the preserve of an elite.

It is now the mainstream expectation. In Victoria we've hit the tipping point: 53 per cent of school-leavers went to university in 2015; and 24 per cent to VET, for a total of 77 per cent in tertiary education.³

So we won't just have more students – we will have much greater spread in the level of preparedness.

Fourth - the politics.

2030 is 14 years and about 5 election cycles away. We *might* have a resolution to the political impasse over higher education funding – but I'm not counting on it.

I see in Australia the same debate playing out across the world: pressure on public budgets, mass demand for education, universities squashed unhappily in the middle.

Although I do note that Norway and Sweden have worked out how to provide high-quality degrees at scale, free of charge. And their economies are doing well.

But that brings me to factor number five: the market, and the technology.

Where there is mass demand, there is a mass market. Where there is a mass market, there will be massive investment. Where there is massive investment, there will be massification of the product.

But by 2030 it won't be mass delivery of a single product. The real potential lies in the capacity to mass deliver a product custom-fit for every student.

That will allow us to get beyond the limitations of the first-generation MOOCs.

In the right context, we know that some MOOCs already work extremely well. I think of the American telecommunications giant AT&T.⁴ It employs 280,000 people – or more than the student body at Monash, RMIT, Melbourne and Deakin combined.

How does it retrain its workforce?

³ Department of Education and Training (Victoria), *On Track Survey 2015: The destinations of school-leavers in Victoria*, October 2015. Available: <http://www.education.vic.gov.au/about/research/Pages/ontrackstatewide.aspx>.

⁴ R King, "AT&T's ambitious effort to retrain more than 100,000 workers", *Wall Street Journal*, 17 March 2016.

It partners with Georgia Tech and private provider Udacity to develop online courses that 120,000 employees have completed thus far.

It is a bold solution, at scale, made possible by a combination of deep teaching expertise and new technology.

But MOOCs won't be right for all – as we can tell from the drop-out rates when people aren't required by their employers to complete a course.

What else works?

I think of Monash University, where teachers in the Faculty of Pharmacy have set up a virtual island they call *Pharmatopia* in the fantasy world of Second Life.

In *Pharmatopia*, students can set up fantasy medtech startups! Run clinical trials! Dispense prescriptions without killing real people!

Most importantly, they can interact with their peers and mentors – not just sitting in the same room, but tackling the same problems.

The US Marine Corps is heading the same way.⁵ It doesn't teach the military history of Ancient Greece by assigning chapters in textbooks. It forces students to think like Athens and Sparta, and replay the battles in online war games.

In 2030, these technologies will seem pedestrian – but their core insight will still be sound. The future of universities is a multiplicity of technologies that can customise and mass-distribute a *human* experience.

And so we come to number six: the Australian context.

All of these trends suggest to me that we have a fantastic opportunity – not an existential threat.

A growth market in our part of the world.

Strong support for higher education in the Australian community.

Pioneers in digital technologies, and in particular, digital education.

And of course, the benefit of a pre-existing reputation.

All of our ambitions for 2030 rest on that foundation. It is vital that we both use it and protect it.

⁵ J Lacey, "Wargaming in the classroom: an odyssey", War on The Rocks, 19 April 2016. Available: <http://warontherocks.com/2016/04/wargaming-in-the-classroom-an-odyssey/>.

I am aware that this might be the last address a Chief Scientist has the opportunity to deliver at an Office of Learning and Teaching forum. So let me just say this: whatever the future of the OLT, the mission of protecting our reputation must endure.

In its current and previous incarnations, the OLT took the best of the lessons learned across the sector and shared them to the benefit of all. It championed the goal of great teaching and reminded us that we cannot rely on research excellence alone.

As a sector, we cannot walk away from that responsibility.

To 2030

So let me finish where I started: in 2030.

In an Australia where the universities have continued to share their learning and teaching methods.

In an Australia that delivers fit for purpose education to the huge number of school-leaver choosing a university pathway.

In an Australia that honours a thousand year history, by making the centuries ahead even better.

Friends, we will reap the success we make, if we have the vision to think at scale and the wherewithal to tackle it together. Let's make it grand.

Thank you.