



The Australian Industry Group

The Future of Australian Apprenticeships

What is required for Australia to strengthen its value and commitment to a quality apprenticeship system?

Megan Lilly
Head of Workforce Development

Level 2, 441 St Kilda Road
Melbourne VIC 3004 Australia

P: (03) 9867 0163

M: 0418 102 119

E: megan.lilly@aigroup.com.au

What is the current state of our apprenticeship system?

The Australian apprenticeship system has a long and proud tradition. It has been responsible for training many men and women in traditional and non-traditional trades over many decades. Individuals who have progressed through the apprenticeship system have gone on to have sustained careers within various trades and be employed, self-employed or manage companies. Key parts of the Australian economy, notably manufacturing, construction and the resources sector, have relied on skills developed through apprenticeships. We can fondly look back and see an apprenticeship system that has been highly valued and enjoyed a strong commitment from employers, unions, the training system, parents, and of course the apprentice. Yet, if asked the same question today, we are unlikely to draw great comfort from the myriad of responses likely to be given.

Declining participation, low completions and poor perceptions have challenged the apprenticeship system. To understand what is required for the Australian system to be more highly valued and for an increased commitment to a quality fit-for-purpose apprenticeship system requires us to explore its current state and suggest areas for reform.

The apprenticeship model is widely understood to be an employment-based training agreement.¹ An individual is employed as an apprentice in a defined occupation while undertaking a related qualification. This qualification is specifically designed to be achieved over time, by means of the integration of training, often off the job, with work. The apprenticeship system itself encompasses a broad array of components. On the supply side this includes: specific funding arrangements; qualifications and their design; training delivery; and state-based delivery systems. Systemic supports for the demand-side include employer incentives; loans and other payments; and support network arrangements. What we do need to consider is how to build the system so that it is fit for the needs of individuals and employers, now and into the future.

Apprenticeships are also commonly understood to be focused on the development of trade skills, usually but not always at the certificate III level. Traditionally, the attainment of a certificate III level qualification within a training plan has formed the basis of the employment agreement, the heart of the apprenticeship system. I contend that the nexus between the certificate III qualification and the employment agreement can be uncoupled: the model can be successfully applied more broadly than trade-based or certificate III qualifications and has great potential to be adapted as a major work-based learning pathway at technician and paraprofessional levels and beyond. Graduates from such a model would develop highly valued skills and employability, blending the best from vocational and higher education.

The Australian apprenticeship system is underperforming. Data compiled by the National Centre for Vocational Education Research (NCVER) record that there were 278 600 apprentices and trainees in training (December 2015), down 11.8% for the same time the previous year. This is compared with 390 700 in training a decade ago and a high of 445 000 in 2012 (NCVER 2016a).² The national data collection combines apprentices and trainees, but does not differentiate trade and non-trade qualifications. The 2012 high point notably includes existing worker trainees, a category no longer available. Over time the level

¹ Traineeships were added to the mix in 1985. Whilst the employment model is the same, traineeships tend to be in different occupations that are not identified as 'trades', in different parts of the economy and of lesser duration. In some economies, traineeships are considered to be preparation for an apprenticeship. For the purposes of this essay, the focus will be on apprenticeships.

² National Centre for Vocational Education Research 2016a, *Australian vocational education and training statistics: apprentices and trainees 2015: annual*, NCVER, Adelaide

of trainees-in-training has moved up and down, according to business conditions, policy changes and funding mechanisms. Traditional apprenticeships have trended down, but at a slower pace. Trade commencements decreased by 10.8% in March 2016 compared with the previous 12 months. Early trend estimates suggest that the trade commencements series shows five consecutive quarters of decline (NCVER 2016b).³ Yet, at the same time, skills shortages began emerging in the November 2015 Australian Bureau of Statistics (ABS) data, identifying that 61% of trades and technician occupations are now experiencing shortage. Furthermore, the completion rate for both apprentices and trainees remains unacceptably low at 58.3%.⁴

Despite considerable investment in the apprenticeship system by both levels of government, it remains bedevilled by layers of complexity and overlap, leading to unnecessary duplication, inefficiencies and confusion. Variable funding models across the jurisdictions, different durations for identical qualifications and differing approaches to regulation are examples of the complexities and confusions within the system.

Attempts to reform the system have been occurring for over two decades. In 1985 the apprenticeship system was expanded to include traineeships as a result of recommendations made through the Kirby Review (Committee of Enquiry into Labour Market Programs 1985); in 1997 the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) endorsed the Principles and Framework for New Apprenticeships for School Students (Australian National Training Authority & Australian Ministerial Council on Education, Employment, Training and Youth Affairs 1997). In 2006 New Apprenticeships was relaunched as Australian Apprenticeships. In 2011, growing concern about the apprenticeship system saw the establishment of a group to investigate it, leading to the report, *A shared responsibility: apprenticeships for the twenty-first century* (Apprenticeships for the 21st Century Expert Panel 2011).

Most recently, the federal government has released the report from the Apprenticeship Reform Advisory Group (2016). Over this period also, many state jurisdictions have reviewed traineeships (normally a delivery-related review), the Council of Australian Governments (COAG) has attempted to tackle occupational licensing, particularly relevant to many trade occupations, and of course the Apprenticeship Harmonisation Group has existed since 2011.

The striking feature of all of this work is that, despite very good intent, any change has been iterative at best and has done little to prevent decline in apprenticeship numbers, completion rates or perceptions related to quality.

The world of work

To tackle the question of how to strengthen the value of, and commitment to, a quality apprenticeship system, we must first consider what is happening to the world of work. This is especially important as work is the organising principle upon which an apprenticeship is built. Therefore, an apprenticeship model fundamentally created in a previous century will inevitably need to evolve, if not be overhauled, in order to meet the needs of the digitised economy.

We live in a rapidly changing world. The fourth industrial revolution, known as 'Industry 4.0' or 'The

³ National Centre for Vocational Education Research 2016b, *Australian vocational education and training statistics: apprentices and trainees 2016: March quarter*, NCVER, Adelaide

⁴ National Centre for Vocational Education Research 2016c, *Australian vocational education and training statistics: completion and attrition rates for apprentices and trainees 2015*, NCVER, Adelaide

Internet of Things’, is transforming manufacturing, once again making it the source of global growth. Driven by digitisation, Industry 4.0 is concerned with the next stage in manufacturing and will connect the impacts of emerging technologies and digitisation across all industries, such as energy, transport and infrastructure. Automation, sensors, cloud computing, big data analytics and machine-to-machine communication are driving new business opportunities through integration with the global supply chain.

Germany is the global leader of the Industry 4.0 movement. Automation and off-shoring caused an 18% decrease in Germany’s manufacturing workforce from 1997 through to 2013, although at the same time production volumes increased (Lorenz et al. 2015).⁵ The Boston Consulting Group’s analysis of the impact of Industry 4.0 on German manufacturing found that it will stimulate a 6% growth in the workforce over the next 10 years (Lorenz et al. 2015).⁶ Manufacturing is also vital for Australia’s economic future. But much needs to be done to enable Australian industry to participate in the fourth industrial revolution — and indeed benefit from it.

The competitiveness of Australian companies in the future will be largely determined by the scope and penetration of new and yet-to-be-developed technologies and how professionally and consistently they are utilised; it will also depend upon companies embracing a holistic approach across their value chain. Germany, for example, is racing towards a digitised value chain. By 2020, 86% of horizontal and 80% of vertical value chains will achieve a high level of digitalisation and will therefore be closely interconnected. Where does Australia stand on this measure?

Our economy faces a number of challenges to ensure we maximise the benefits of the fourth industrial revolution. Two key things stand out. Firstly, we will need to adopt global digital platforms and standards. Although this will merely get us a ticket ‘into the game’ in a globalised and digitised world, it is an essential precursor to participation. The World Economic Forum (WEF) notes ‘new technologies are driving winner-takes all dynamics for an increasing number of industries [therefore] getting there first matters’ (World Economic Forum 2016).⁷

Secondly, we will need to retool the nation. Developing new and different skills utilising the right digital technology will be vital. This has major implications for our education and training provision, as well its intersection with work. The apprenticeship system sits neatly in this space. It is capable of providing a high-quality, fully integrated learning and employment experience at the leading edge of economic transformation. The education and training system should not always have to chase the future; it should be part of it.

⁵ Markus Lorenz, Michael Rüßmann, Rainer Strack, Krud Lasse Lueth & Moritz Bolle, Boston consulting Group ‘Man and Machine in Industry 4.0 September 2015)

⁶ Michael Rüßmann, Markus Lorenz, Phillip Gerbert, Marela Waldner, Jan Justus, Pascal Engel & Michael Hermisch. Boston Consulting Group, “Industry 4.0: The Future of Productivity and Growth in Manufacturing Industries”, 9/4/2015

⁷ World Economic Forum(WEF), ‘Report Highlights’ (July 2016), <http://reprot.d.weforum.org/global-information-technology-report-2016/report-highlights/>

Configuring our education and training system to meet the needs for the future

Historically, our education and training system has been built and developed around public training institutions. They have been the institutions providing formal credentialled learning. That has been their expertise and they have been funded on this basis. However, just as the world of work is rapidly transforming, education and training is receiving the same level of disruption. Education has not been the exclusive prerogative of training institutions for some time. The acceleration of digital applications and solutions, as well as skills and knowledge requirements emanating from work, has compounded this pattern. We are now seeing micro-credentialling, digital badging, e-portfolios and the proliferation of open source learning platforms. In this world, the design of a qualification is challenged, as are funding models, the role of institutions and the relationship between learning and credentialling. On the surface many of these seem to pull in a different direction from that of the apprenticeship model. But not necessarily. The organising principle for education and training systems into the future needs to continue to shift to the individual and work. Some individuals will train in order to gain work; others will build their learning through work. Either way, the strength of work-based learning models will be important. Qualifications will need to be designed differently, chunked differently and be accessible across contexts in many more varied and timely ways.

The challenge for this new world is to ensure that all learners, including apprentices, gain a robust and rigorous base upon which to build skills and experience over the course of their working life. Some will become workers typified by the 'gig economy' — workers who will abandon the traditional 9.00 am to 5.00 pm employment in favour of working independently on a task-by-task basis for various employers, including in high-skill areas. These workers will be supported by digital talent platforms, linking workers with employers. They will accumulate a range of skills, experiences, credentials (micro and traditional) and digital badges over decades. Others will need to build a strong initial platform upon which they can continue to grow and extend their skills and experiences.

The importance of the science, technology, engineering and maths (STEM) disciplines for the future economic and social wellbeing of Australia cannot be underestimated. International research indicates that 75% of the fastest growing occupations require STEM skills and knowledge (Becker & Park 2011).⁸ Furthermore, occupational structures are also changing. Different blends of skills are required for many occupations, and completely new jobs are frequently emerging. The Foundation for Young Australians estimates that 60% of students are currently being trained in jobs that will be radically changed by automation over the next 10 to 15 years. If we focus on vocational students alone, this figure jumps to 71% (Foundation for Young Australians 2015).⁹ Many of the growth industries increasingly require higher levels of skills. The tacit limitation of the apprenticeship model — the delivery of certificate III trade skills alone — will render the apprenticeship system unable to meet many of the challenges of the digitised economy.

⁸ Becker, K and Park, K: Effects of integrative approaches among STEM subjects on students learning. *Journal of STEM Education* 12 July-September, 2011.

⁹ Foundation for Young Australians: *The New Work Order* 2015

Is the apprenticeship model well placed to meet the challenges of developing skills in this rapidly changing world?

I would contend that the core principles of the apprenticeship model are well placed to develop many of the skills required into the future, but I am less confident that our apprenticeship system is up to the task.

The apprenticeship model can combine the strength of work-based learning for individuals while in employment in its traditional areas, as well as in new and emerging areas. The recent UK report, Post-16 skills plan (Department for Business, Innovation and Skills & Department of Education 2016), building upon the Sainsbury Panel recommendations (Independent Panel on Technical Education 2016) and the Richard review of apprenticeships (Richard 2012), followed by the English apprenticeships: our 2020 vision (Department of Business, Innovation and Skills 2015), all outline plans to increase both the quality and quantity of apprenticeships in the UK, with the aim of reaching three million apprenticeship commencements by 2020.

The central feature of this model is to place employers in the driving role of the system. This will be achieved by focusing upon the needs of businesses through employer-designed standards that extend through to degree-level apprenticeships. This will be supported by the establishment of the Institute for Apprenticeships, a new independent employer-led body to regulate the quality of apprenticeships, by 2017.

The German dual system embraces expanded models of apprenticeships. Dual study programs, which transfer the principles of practice-oriented learning to university studies, are available. The University of Applied Science in Munich provides a program that consists of several practical blocks at a company, together with study phases at a university. Students gain considerable practical knowledge at a company alongside their studies and can earn a vocational diploma, as well as a university degree.¹⁰

An example of a project that heads in this direction in Australia is the recently announced Industry 4.0 Higher Apprenticeship project. Ai Group is leading this project, in conjunction with Siemens and Swinburne University.

Industry 4.0 Higher Apprenticeship project

The project utilises an apprenticeship framework to deliver a new Diploma and Associate Degree in Applied Technologies. The aim is to create an apprenticeship model that will support the higher skills needed for the emerging fourth industrial revolution, or what has become known as Industry 4.0.

The project is led and managed by the Ai Group and will be implemented in collaboration with Siemens Ltd and Swinburne University of Technology. It is anticipated that other companies closely associated with Siemens will also join the project. Jeff Connolly of Siemens Ltd is the chair of the Prime Minister's Digital Taskforce.

The program will enable employers to train future technicians to a higher skills level to meet their increasing needs in the knowledge economy. Up to 20 school leavers will be employed as apprentices at Siemens for the duration of the project, from 2017 to 2019, inclusive.

¹⁰ The example is taken from the University of Applied Science in Munich.
https://hm.edu/en/course_offerings/dual_2/index.en.html

Swinburne University of Technology will design and deliver the program, which will include a range of elements, including Industry 4.0 and the Internet of Things, IT Disruptive Technologies, Engineering, Design and Business. The program will directly articulate into a bachelor's degree, which will also be developed during the life of the project. It is anticipated that the greatest part of the program will be delivered in the workplace and be supported by the latest digital platforms.

The project will provide higher-level qualifications and appeal to a broader cross-section of young people than the apprenticeship model currently does. The young people will gain these qualifications while working in a company that is a technology leader. The qualification will meet the particular needs of industry, with a focus on the adoption of high-level technology skills and the tools required for the future workforce.

The qualification brings together key industry initiatives and policies, such as the National Science and Innovation Agenda and the Growth Centres initiatives, into a practical experiential learning environment to address real industry needs. The pilot combines the best of university and vocational learning models and aims to improve the STEM skills of technically minded participants. It also incorporates skills for the new millennia in business and design.

The real challenge of reforming the apprenticeship system

For the apprenticeship system to realise its potential as being the most effective skills-development pathway while individuals are in employment, considerable reform is required. Building the supply of candidates and participants is essential and will involve reconsidering pathways into apprenticeships, as well as the apprenticeship models within the system itself. The qualifications undertaken will need to evolve to include new skills and different jobs. Not only will these need to be closely linked to our transforming workplaces, they will increasingly require integration across vocational and higher education. A tertiary education sector that values both the strengths of vocational education and higher education is required. Similarly, qualification design comes into question, as does the need to explore a more coherent and equitable funding system across the entirety of the tertiary sector.

Ensuring national consistency of product and delivery, supported by appropriately funded, flexible and quality provision, will assist in building employer confidence in the system. This would include fully embracing high-quality, industry-endorsed work-based delivery models and strengthened assessment arrangements and a much stronger model of national coordination, one that fully understands the impact of the various federal and state government elements that influence the decision to take on apprentices. Indeed, the establishment of a national oversighting body to drive Australian apprenticeship policy, perhaps similar to the proposed UK Institute for Apprentices, would be timely.

Employer incentives and Apprentice Support Network arrangements are significant demand-side considerations. While these are important features of our apprenticeship system, they too need to be considered in regard to how they best assist a reformed and expanded apprenticeship system. The demand side can be further supported through group training. Group training companies are unique to the Australian apprenticeship system, in that they are demand-side third-party platforms that could be utilised to drive greater innovation and reform in apprenticeship arrangements. Their ability to aggregate demand, thereby creating critical mass for supporting innovative approaches and overcoming thin markets, is another potential area to be tapped.

There are many challenges to be tackled. The time is nigh!

References

- Apprenticeships for the 21st Century Expert Panel 2011, A shared responsibility: apprenticeships for the 21 century: final report of the Expert Panel, Commonwealth of Australia, 2011.
- Apprenticeship Reform Advisory Group 2016, Recommendation report, Dept of Education and Training, Canberra. Becker, K & Park, K 2011, 'Effects of integrative approaches among STEM subjects on students learning', Journal of STEM Education, 12, July–September.
- Committee of Enquiry into Labour Market Programs 1985, Report (Kirby report), AGPS, Canberra. Foundation for Young Australians 2015, The new work order, FYA, Melbourne.
- Independent Panel on Technical Education 2016, Report (Sainsbury Panel report), HMSO, London.
- Lorenz, M, Rüßmann, M, Strack, R, Lueth, K & Bolle, M 2015, Man and machine in Industry 4.0: how will technology transform the industrial workforce, Boston Consulting Group, Sydney.
- Australian National Training Authority (ANTA) & Australian Ministerial Council on Education, Employment, Training and Youth Affairs 1997, Principles and framework for New Apprenticeships for school students, ANTA, Brisbane, viewed 14 Oct 2016, <http://hdl.voced.edu.au/10707/126039>.
- NCVER (National Centre for Vocational Education Research) 2016a, Australian vocational education and training statistics: apprentices and trainees 2015: annual, NCVER, Adelaide.
- ——2016b, Australian vocational education and training statistics: apprentices and trainees 2016: March quarter, NCVER, Adelaide.
- ——2016c, Australian vocational education and training statistics: completion and attrition rates for apprentices and trainees 2015, NCVER, Adelaide.
- Richard, D 2012, Richard review of apprenticeships, School for Startups, London.
- United Kingdom Department for Business, Innovation and Skills 2015, English apprenticeships: our 2020 vision, HMSO, London.
- United Kingdom Department for Business, Innovation and Skills & Department of Education 2016, Post-16 skills plan, HMSO, London.
- World Economic Forum (WEF) 2016, 'Report highlights', viewed 13 October 2016, <http://reports.weforum.org/global-information-technology-report-2016/report-highlights/>.