The Robots Are Coming…..

May 2019 update

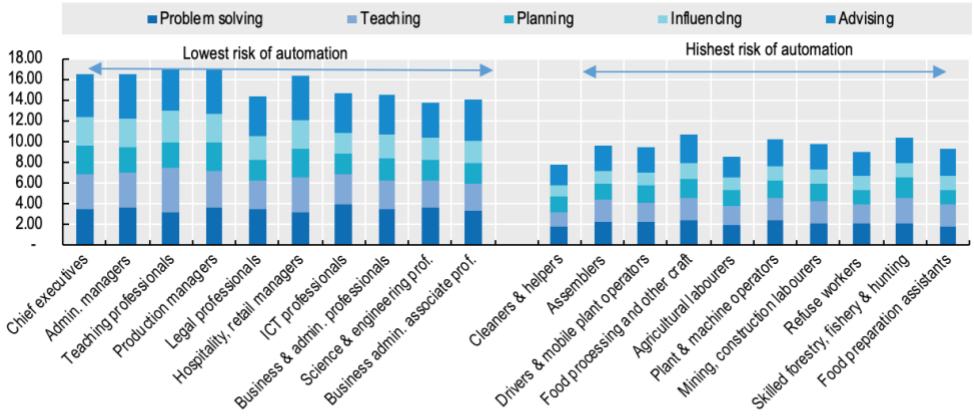
We're all aware that the world of work is changing – and that brings skills development challenges for the tertiary education sector. Before exploring them – a note of optimism for those of you worried that the robots won't just arrive, they'll take over – a recent report by the OECD reminds us that:

> "Despite widespread anxiety about potential job destruction driven by technological change and globalisation, a sharp decline in overall employment seems unlikely. While certain jobs and tasks are disappearing, others are emerging, and overall employment has been growing."

The same report identifies the risk of automation across different occupations:

Figure 1: Risk of automation and skill content of jobs, OECD average

Task frequency by occupation, top ten and bottom ten occupations by risk of automation



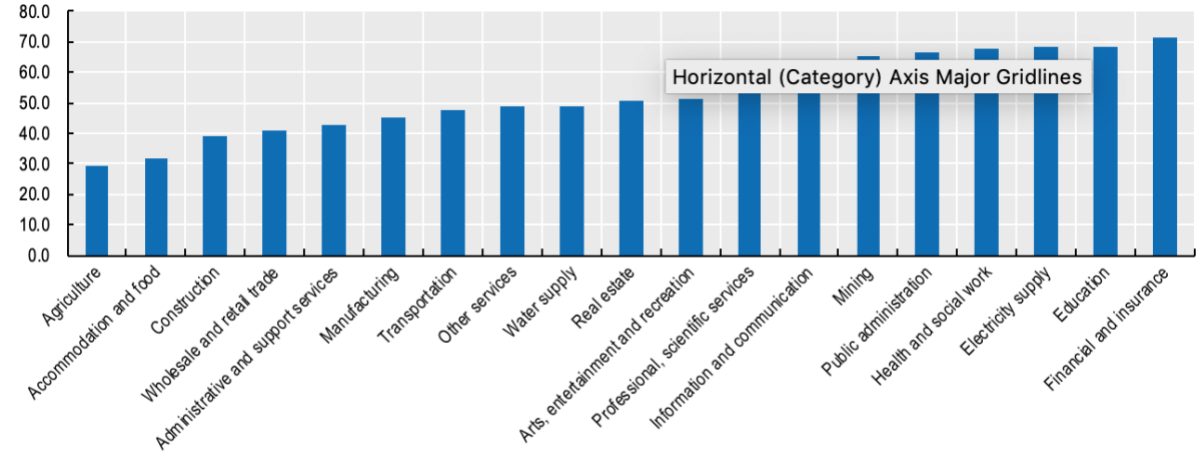
Note:For each task, frequency is measured on a 5-point scale, ranging from 1 Never to 5 Every day. The value reported is the average frequency of respondents in each occupation. The ranking by risk of automation is derived from Nedelkoska and Quintini (2018[7]), Automation, skills use and training, OECD Social, Employment and Migration Working Papers, https://dx.doi.org/10.1787/2e2f4eea-en.

Source: OECD calculations based on the Survey of Adult Skills (PIAAC) (2012, 2015).

It also identifies the level of participation in training by industry across the OECD:

Figure 2: Adults' participation in training, by industry

Share of adults (16-65) in each industry that participate in training, OECD average, 2012/2015



Note: Share of adults who participate in formal or non-formal job-related training over the previous 12 months. Data refer to 2012 for most countries, except for Chile, Greece, Israel, Lithuania, New Zealand, Slovenia and Turkey where they refer to 2015.

Source: Survey of Adult Skills (PIAAC) (2012, 2015).

Keeping up with technological change in Australia is becoming a critical issue according to recent research by Deloitte, with claims that Australia is falling behind in terms of both investment and skills development in AI.

While these research reports help us understand some of the changes happening to the world of work in its broadest sense – what they lack are the details which are crucial for the education sector. That is understanding **how technology is changing work in different occupations**.

To help you keep track of the changes (and to allow you the time to think through the kinds of changes you may need to make to your course content and delivery), I periodically publish updates drawing from recent media showing how technology is changing work in different industries and occupations.

I hope you find this latest update useful in understanding the changes technology is bringing to the world of work your education provider focuses on.

Transport

Overwhelmingly it is the transport sector which is generating the most news items about technological disruption. While the rollout of driverless technology is clearly not without challenges and is proceeding more slowly than some envisaged – it is now happening in trials across Australia and across the world. If you educate people to work in this sector – it's pretty clear 'business as usual' (or 'training as usual') will in the near future no longer be feasible.

- Overland 'hyperpods' which will allow travel from Sydney to Melbourne in an hour
- Retirement villages likely to be early adopters of driverless cars ($)
- A low-altitude airspace management system to allow the safe operation of drones (which could be a prelude to flying taxis) ($)
- Keeping pilots awake using technology developed for the mining sector ($)

- AI brings potential prejudice to driverless cars which could have tragic consequences
- Chinese companies expanding in California's driverless car sector
- Australian firm accepting orders for jet powered flying motorbikes
- Using AI and Big Data to identify and amend flight plans at Qantas ($)
- A mobile phone app to help you find the perfect carpark
- Aerial drones will reshape low-level airspace above cities ($)
- Australia manufactures its first electric car
- Experts hack Tesla's systems and force cars to switch lanes ($)
- Cars already track our voices, soon they will follow our eyes
- Drones approved for deliveries of food, medicine and coffee in Canberra
- Boston Dynamics' mini-robot moves into the haulage business
- Robot taxis are coming soon says Tesla
- Google's drone, Wing, gets approval to deliver packages commercially
- Drones delivering vaccines across Ghana
- Sweden exploring how to build roads which can recharge electric vehicles
- Sydney's first driverless train due to leave the station shortly
- Uber looking to test flying taxis in Sydney or Melbourne ($)
- Amazon emerges as a threat to the transport and logistics sector ($)
- Germany's Lilium launches the first flying taxis
- Google's driverless cars need to understand how Aussies drive

Agriculture/environment

- Using AI to predict, monitor and alleviate natural disasters ($)
- Robots picking apples in New Zealand
- AI helping farmers and babies in the developing world
- Maggots and robots to improve agriculture ($)

Assistance/personal care

- Robotic puppies and kittens helping dementia patients
- Robot hairdressers – maybe not yet
- An app for your phone to assist blind people ($)
- A new wheelchair prototype – designed by students
- Transforming refugee resettlement through technology

'Blue collar' work

- A manufacturing revolution: 'knitting' a sports car from carbon fibre ($)
- Hairdresser using 3-D printings to turn waste plastic into prosthetic limbs
- How Japan is using automation to save its car manufacturing industry
- Robotic traffic cones deployed in Melbourne to enhance worker safety
- Robot bricklayer builds a house in three days ($)
- Australia's mining operations becoming increasingly autonomous ($)
- Retrenched car worker now building 3-D prosthetic limbs

Creative industries

- Using AI to create art – and sell it at Christies ($)
- Using computers to design and 'grow' our clothes
- China's latest music star – a hologram idol
- The first solo art gallery exhibit devoted to an AI artist
- Growing authentic diamonds in labs ($)
- Artificial intelligence could have a role in movie making ($)
- AI is best used to support human capacity for creativity and discernment
- Harry Potter follows the lead of Pokemon Go with new AR game ($)

Defence

- Making armed drones act ethically in future war scenarios
- Developing new missile systems, radar jammers and laser cannons to combat the threat from drones ($)
- US Army reassures on robot tanks' compliance with AI murder policy
- One of the creators of AI is now worried about 'killer robots'

Education

- Studiosity's new peer-to-peer learning app – Uber for education ($)
- Robot teacher of Buddhist thought
- VETtrak and Esher House using AI to help support student completion rates
- 9 ways that AI can help improve student outcomes
- Finland, Switzerland and New Zealand lead the way in teaching future skills
- Universities' preparations for AI – survey with Microsoft ($)
- AI chatbots transforming higher education student support

Finance/insurance

- AI moves into lending market but won't replace humans ($)
- Using AI and linguistics to improve bank risk cultures ($)
- Investment firms struggling to hire data scientists
- How technology is already being used to adjust insurance premiums
- Robots to manage your investments
- More than 1 million Australians could use robots for financial advice

Health

- Using AI to detect and prevent strokes before they hit ($)
- Using 3-D printers to make human ears for children
- Using VR therapy to distract patients during surgery
- Medical robots are already in place across the hospital system ($)
- Microscopic bug-shaped robots for insertion into blood vessels ($)

- Wearable devices which could help prevent strokes ($)
- Using AI to help fight diabetic blindness
- Using 5G technology to supervise major surgery from miles away
- Nano-technology offers lab-grown retinas and custom made bones
- Healthcare innovation being driven by robots and machine learning ($)
- AI beats elite doctors in diagnosing brain tumours
- Scientists use 3-D printing to create a new heart
- An ultrasound scanner and an iPhone bringing significant health benefits across Africa, Asia and Latin America
- Prosthetic voice creates speech from brain signals - no muscles needed
- Australia is failing to harness the opportunity of AI in health and other sectors ($)
- Using AI to detect lung cancer – and outperforming the experts

Hospitality

- A 3-D printed 'vegan' steak – 10 minutes to print and 2 minutes to cook
- Robot baristas which can serve up to 100 cups of coffee an hour

New jobs

- A progress update on Google's robotics program
- Why re-skilling and not hiring is the answer as firms introduce innovation ($)
- China intends building a scientific research station on the moon within a decade

Retail and Warehousing

- Almost 90% of UK shoppers shop online with Amazon
- Bunnings pushes ahead with online retailing
- Coles looking to introduce major changes to retailing with 'Supermarkets 3.0'
- Using bio-feedback to improve retail sales
- The robots coming to choose your groceries ($)
- The Boston Dynamics robot is hard at work in the factory
- Giant US retailer Walmart introduces robots for shelf stocking and cleaning ($)
- The growth in autonomous supermarkets in the US
- Coles introduces 2,000 robots into its warehouses ($)
- Amazon offering warehouse employees 3 months' salary to start delivery businesses

Security

- China's not the only place with extensive surveillance – this from the NYT Privacy Project
- Australia's biggest facial recognition, mass surveillance system was too rushed
- Scanning car licence plates to reduce crime and raising privacy concerns
- San Francisco bans facial recognition surveillance and sparks debate
- Your appearance in the background of a Tik tok video shot in Europe will be logged using facial recognition software in China

Technology

- The battle to control AI: Google's Singularity ($)
- How CSIRO's Data 61 is helping Australia with hypersonic flight, self-healing materials, advanced manufacturing, and Industry 4.0 ($)
- Technology which allows bosses to monitor their workers' every move
- Tricking AI: Is tricking a robot hacking?
- Robots determining who gets to work and who gets laid off ($)
- Microrobots the size of a speck of dust could fix mobile phone batteries and your brain
- What it's like to work at Huawei – in pictures

'White collar' work

- Travel companies adopting AI and other technologies to improve their offerings
- Continuing expansion of AI's role in recruitment ($)
- Using AI to identify and predict corruption issues
- AI machine learning creating language and making coherent arguments
- Plans underway to build Australia's first smart city ($)
- Using AI (and reading your emails) to work out when an employee is likely to quit
- How robots are disrupting white collar work in a range of industries ($)
- Technology moves into the real estate sector ($)
- Using technology to help small businesses with export documentation ($)
- Computer programs that write adverts and love puns

Other issues

- The rollout of China's social credit system sees millions banned from travel and photos of debtors being screened before movies
- The pros and cons of China's extensive surveillance network ($)
- The challenges of building ethical Artificial Intelligence
- Robots will change how we form human relationships
- Robots could make us better as human beings but we need to understand them now
- Calls for an 'AI Policy Council' to govern the use of personal data in algorithms ($)
- Up to 28 million jobs could be lost across the ASEAN region as a result of the rise of the robots
- Robots and artificial intelligence will widen inequality ($)
- Why China could win the technology 'cold war' with the US ($)
- The West is falling behind China when it comes to technology
- Amazon's head of robotics says they create jobs rather than just displacing workers ($)
- Tik Tok as a soft power influence and potentially China's most important export
- Facebook is struggling to recruit following Cambridge Analytica scandal
- IBM calls for agreement on ethical AI

And some good news – the robots haven't got it all under control just yet!

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