



Pilots, Drones, Future Jobs and the Education Landscape

Fraser Coast Drone Conference

19 June 2019

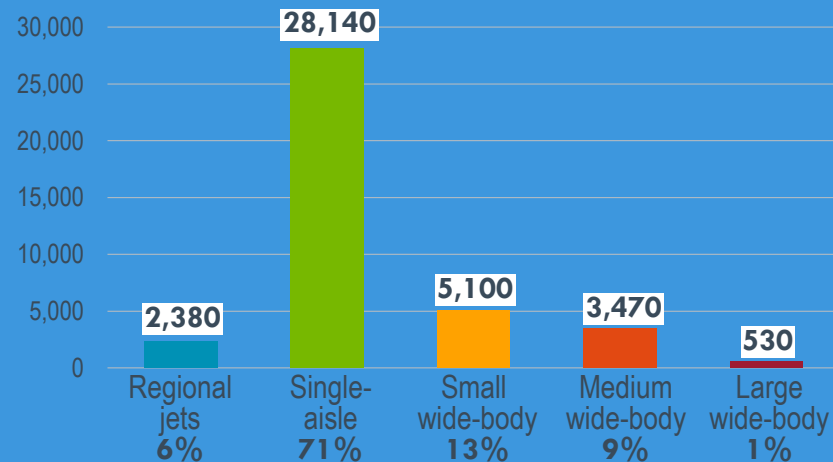
Marilyn Andre

AIRLINES NEED 39,620 NEW AIRPLANES VALUED AT \$5.9 TRILLION



Airplane deliveries: 39,620

2016 - 2035

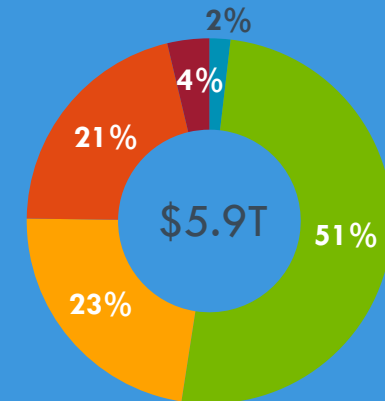


<https://www.boeing.com/commercial/market/pilot-technician-outlook/>

Market value: \$5.9T

2016 - 2035

Airplane Type	Value
Regional jets	\$0.1T
Single-aisle	\$3.0T
Small wide-body	\$1.4T
Medium wide-body	\$1.3T
Large wide-body	\$0.2T
World Total	\$5.9T



NOTE: market share may not equal 100% due to rounding

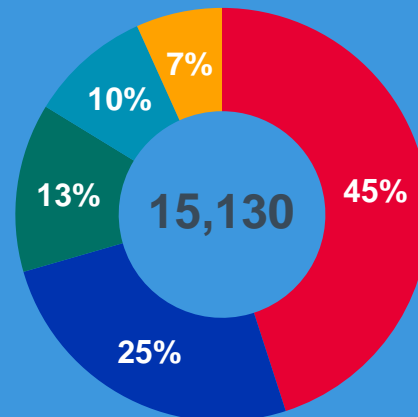
CURRENT MARKET OUTLOOK: ASIA PACIFIC



New airplane deliveries by region

2016–2035

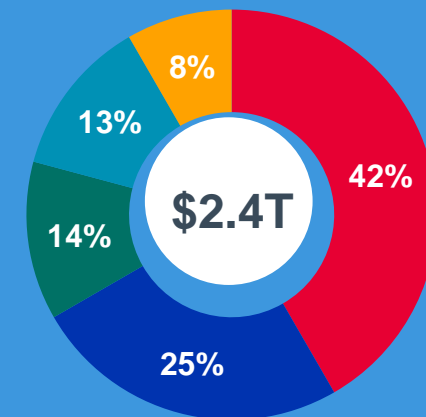
Region	Airplanes
China	6,810
Southeast Asia	3,860
South Asia	2,000
Northeast Asia	1,440
Oceania	1,020
APAC Total	15,130



Market value by region

2016–2035

Region	\$T
China	1.0
Southeast Asia	0.6
South Asia	0.3
Northeast Asia	0.3
Oceania	0.2
APAC Total	\$2.4T



MARKET TO BECOME EVEN MORE GEOGRAPHICALLY BALANCED



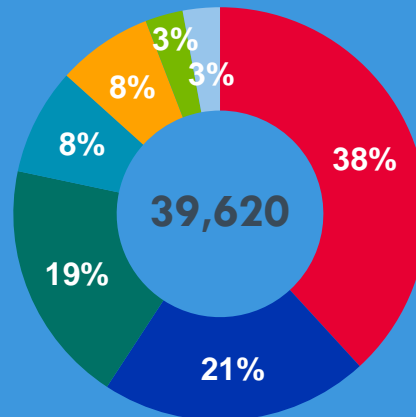
New airplane deliveries by region

2016–2035

Region	Airplanes
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Asia	15,130
North America	8,330
Europe	7,570
Middle East	3,310
Latin America	2,960
C.I.S.	1,170
Africa	1,150

World Total	39,620
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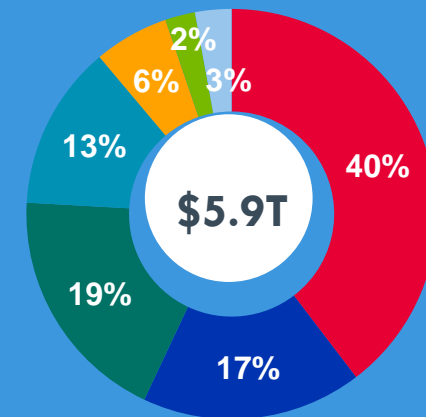
Market value by region

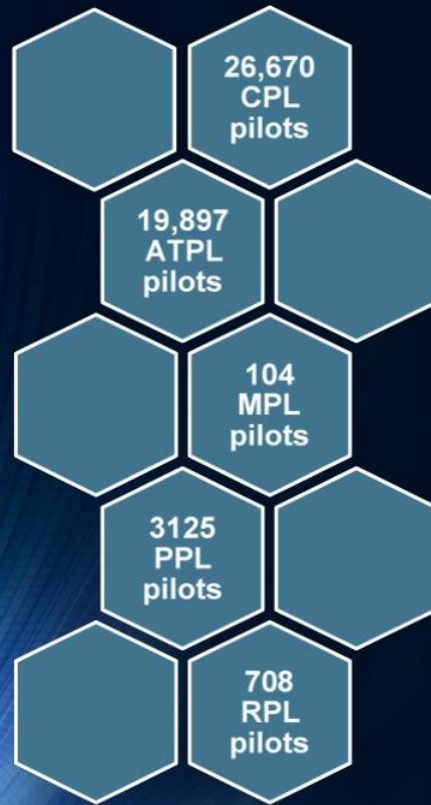
2016–2035

Region	\$T
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Asia	2.4
North America	1.0
Europe	1.1
Middle East	0.8
Latin America	0.4
C.I.S.	0.1
Africa	0.2

World Total	\$5.9T
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Source: Annual Report on Chinese Civil Aviation Development 2016, CAAC

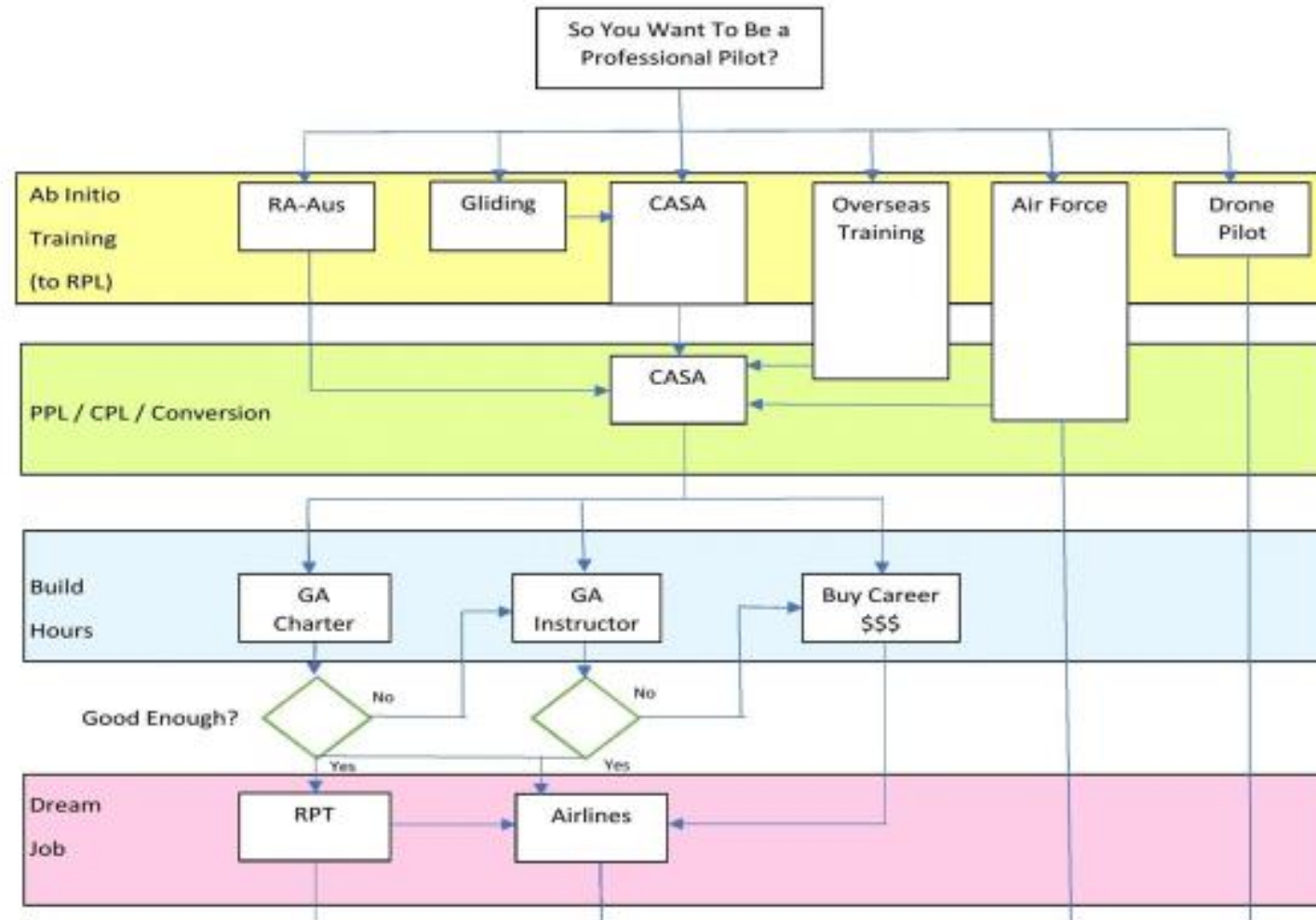
EXISTING PILOTS & INSTRUCTORS:

50,504 registered pilots (Dec 2016) – up 10.9% from 2015

6,044 instructor pilots working in China (Dec 2016)

China will need an additional 111,000 new pilots by 2035 (Boeing)

Air traffic over China set to quadruple in the next two decades (Airbus)



<https://aerocircus.com.au/aussie-pilots-career-path/>

YEAR 12 STUDENT TO PILOT CAREER PATHWAYS

	DEFENCE FORCE PILOT		AIRLINE PILOT CADET PROGRAM		FLYING SCHOOL		AVIATION DEGREE	
Training/ Study Costs	✓	Fully funded by the ADF	✓	Mostly company funded	✗	Self funded	✗	Mostly self funded
Training/ Study Length	✓	4 years (Get paid to study)	✓	Around 1.5 years	✓	1-2 years	✗	4 years
Tertiary Education	✓	UNSW@ADFA	✗	None	✗	None	?	Several second/ third tier universities (generally ranked medium-low) offer such degree
Degree Recognition	✓	All degrees from arts to science are widely recognized	✗	None	✗	None	?	Less recognized by general employment market
Certainty of Completion	✓	95%	✓	95%	✗	50%	✗	50%
Prospective Employer	✓	Australian Defence Force	✓	Major airlines	✗	General aviation	✗	General aviation
Total Salary Expectation	✓	Year 1-10: \$65K to \$120K	✓	<ul style="list-style-type: none"> • Year 1-4: \$72K to \$110K • Year 5-6 (be promoted to Captain): \$190K+ 	✗	Year 1-10: \$35K to \$65K	✗	Year 1-10: \$35K to \$65K

What does this mean to the drone industry?

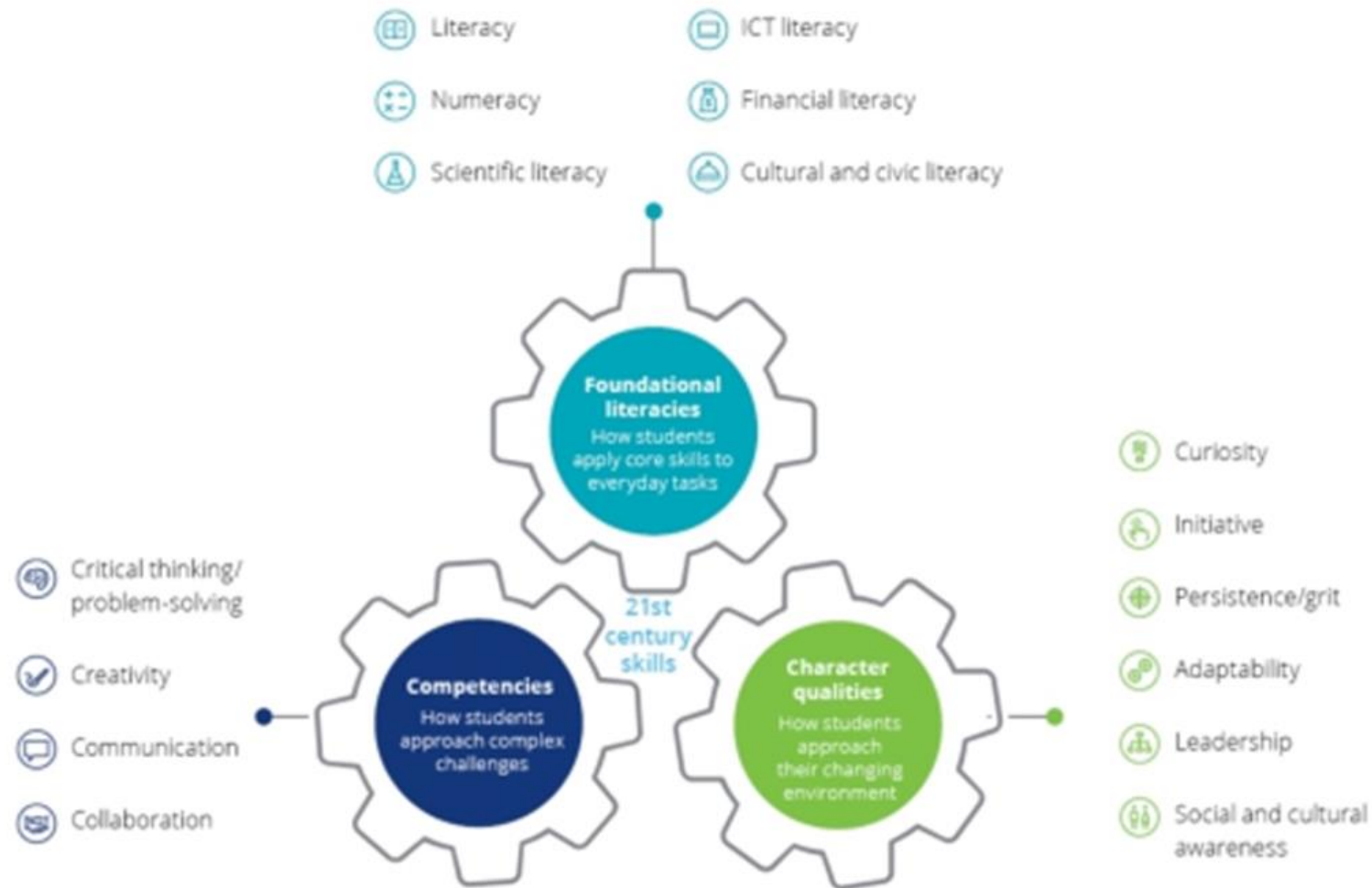


WHAT SKILLS WILL THE AUSTRALIAN WORKFORCE NEED?

The accelerating pace of technological, demographic and socio-economic disruption is transforming industries and business models, changing the skills that employers need and shortening the shelf-life of employees' existing skill sets in the process. [...]

Even those jobs that are less directly affected by technological change and have a largely stable employment ... may require very different skill sets just a few years from now as the ecosystems within which they operate change.

Three skills dimensions for future work



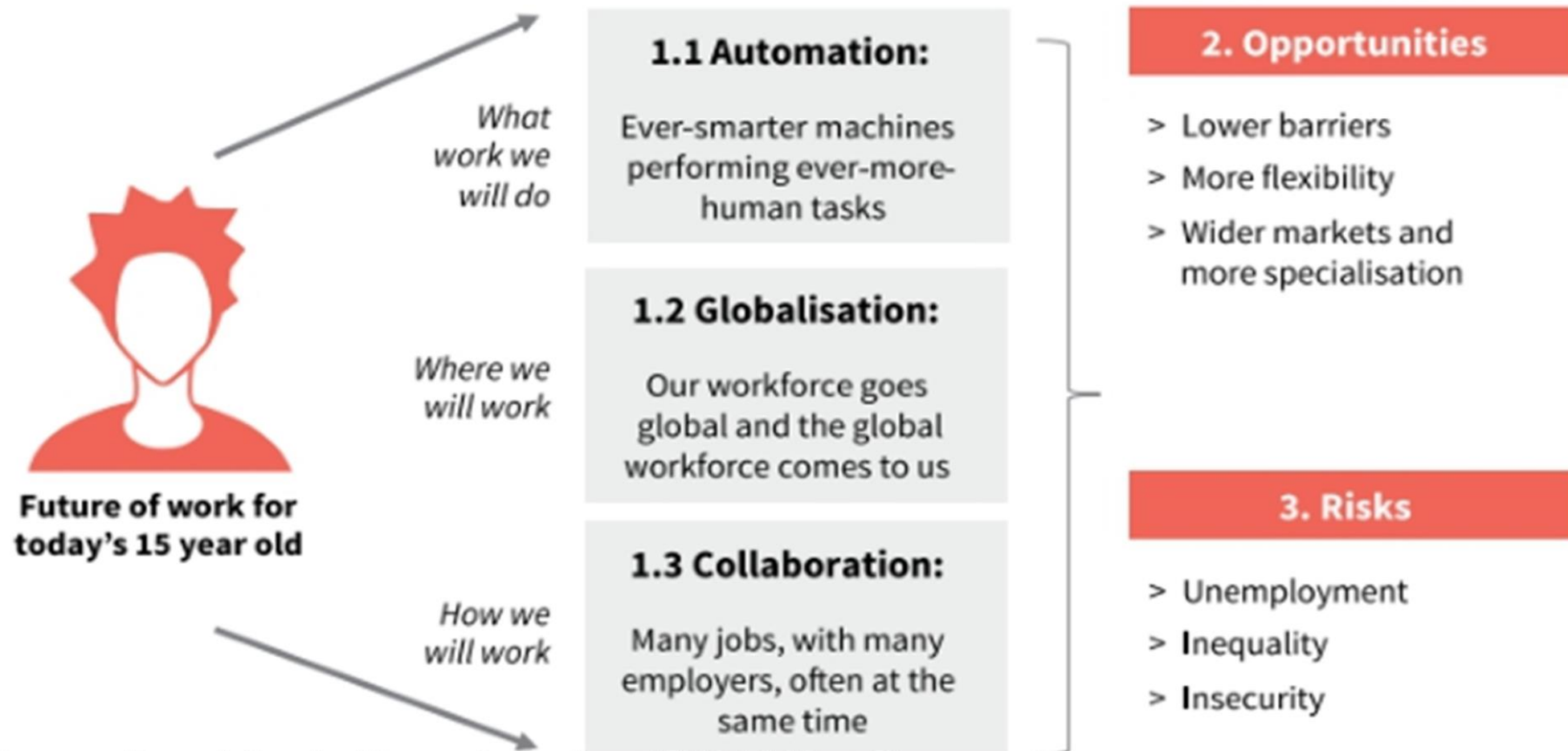
Source: Deloitte Access Economics (2017).

Typologies of future skills (non-technical soft skills)

Skill	Employability skills	Australian Curriculum	DeakinCo.	WEF future skills 2020	Economist Intelligence Unit
Self-management	X	X	X		
Communication	X		X		X
Teamwork (including collaboration)			X	X	X
Problem-solving	X		X	X	X
Critical thinking		X	X	X	X
Digital/technology literacy	X	X	X		X
Emotional judgement		X	X	X	X
Global citizenship		X	X		
Ethics		X	X		
Innovation			X		
Creativity		X	X	X	X
Continuous learning	X				
Enterprise skills	X				X

Source: Bowles and Lanyon (2016a); WEF (2016); Economist Intelligence Unit (2015); Department of Education and Training (2016); Australian Curriculum, Assessment and Reporting Authority (2016).

Future of work for today's 15-year-old



Source: Foundation for Young Australians (FYA 2015, p. 7).

FUTURE WORKFORCE REQUIREMENTS

Soft skills and transferable skills will be valued as jobs transform and workers need to transfer skills horizontally across occupational and industry boundaries

Formal and informal learning in a lifelong, continuous process will enable people to navigate technological disruption to their work and career pathways

IMPACT ON THE VET SECTOR

No competency standards directly address the skills required to design and implement automation

Training packages that are extremely exposed to the impact of automation include:

transport and logistics, construction, property services, information technology, manufacturing, and defence

At least 280 units of competency contain an activity or component that involves Automation

KEY POINTS ON FUTURE JOBS

Job displacement will be uneven and difficult to predict across occupations, industries and locations

The way that emerging technologies will shape automation in future for each industry and occupation cannot be accurately predicted



Questions?



