Tasmanian ICT Workforce Action Plan 2020-23











Contents

Introduction	, I
Key drivers for change	. 2
Snapshot of the Tasmanian ICT Workforce	. 3
Strategic priorities	. 4
Action Area 1: Collaboration and insight	. 5
Action Area 2: Capacity building	. 7
Action Area 3: Capability building	. 8
Action Area 4: Diversity and inclusion	10
Action Area 5: Profile raising	11
Action plan summary	12
Appendix I – Case studies	13

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Introduction

Tasmania's future economic growth and prosperity will be increasingly dependent upon its ability to effectively respond and adapt to rapid technological change and disruption. This ability will rely heavily on the capacity and capability of Tasmania's ICT workforce.

To ensure that Tasmania is well-positioned to take advantage of the dynamic and evolving technology landscape, the Tasmanian Government has taken action through its IT and Innovation Policy, to support the development of a new workforce plan for the ICT sector in partnership with industry and education stakeholders.

The Tasmanian ICT Workforce Action Plan 2020-2023 has been developed by a Working Group representing organisations that will play a pivotal role in shaping the future of Tasmania's ICT workforce, including:

- TaslCT
- Australian Computer Society
- University of Tasmania
- TasTafe

- Department of Education
- Department of Premier and Cabinet
- Department of State Growth

This plan was developed through broad industry consultation and targeted research, including an ICT Industry Summit and Ministerial Roundtable held in June 2019.

The aim of this plan is to build the capacity, capability, diversity and profile of the ICT workforce to drive the ongoing digital transformation of industry and enable future economic growth and prosperity.

The plan identifies 10 strategic priorities that will be addressed by a range of collaborative actions and partnered initiatives.

The implementation of these actions will be overseen by an ICT Workforce Advisory Committee that will be established in the first quarter of 2020, with progress and outcomes reported to the Minister for Science and Technology and the Minister for Education and Training.



Key drivers for change

The global economy is in the midst of the fourth industrial revolution ("Industry 4.0"), driven by the ongoing convergence of digital technologies that connect the digital with the physical world. The digitalisation and connectivity of the economy and society, and more specifically the digital transformation of industry is a critical factor for Tasmania's competitiveness, growth and jobs.

While the speed and impact of digital transformation varies across Tasmanian industries, it is clear from consultation with exemplar sectors such as primary production, healthcare and advanced manufacturing that the need for digital skills is becoming urgent. Research indicates that there is an increasing need for workers with high-level skills in emerging technologies coupled with industry domain knowledge, as well as the enterprise skills necessary to manage digital change and transformation projects.

These local findings concur with industry consultation conducted by PwC's Skills for Australia! that identifies the following broad trends that are shaping current and future ICT skills needs across Australia:

Emerging digital technologies: Industry demand for emerging skills due to new technological trends are drastically increasing. In particular, there is demand for high level technical skills required to understand, develop and work with emerging technologies such as artificial intelligence, blockchain, Internet of Things, cloud computing and cyber-security, as well as emerging software development methodologies and practices.

More connected economy: Businesses are increasingly embracing digital connectivity and relying on cloud-based databases and software-as-a-service to support their operations. Organisations are moving from a 'cloud first' strategy towards a 'cloud only' strategy². As a result there is increased demand for skills in cloud computing, datamanagement, data-confidentially and cybersecurity. In addition there is an increasing need for project and change management skills to support digital transformation initiatives.

Changing workplace roles: With digital becoming the core of organisational strategy, new and emerging ICT roles are rising in prominence, and ICT professionals are increasingly involved in strategic decision making across business functions. With these workplace changes, ICT roles have an increased need for enterprise skills (such as teamwork, communication and design thinking) and broad knowledge of functional areas such as finance, sales, marketing and production.

Supporting the automation of roles: Automation is expected to impact job roles and skills across all industries in Australia – from asset-intensive sectors such agriculture and mining to service sectors such as healthcare and education. As more manual processes become automated, businesses will require specialist ICT skills in automated system development, robotics, system diagnosis and maintenance. In addition, these roles will require workers to have strong operational, functional and industry specific domain knowledge.

¹ PwC's Skills For Australia, ICT Industry Skills Forecast and Proposed Schedule of Work, May 2019

² Telsyte, Australian Cloud Market Survey, April 2019

Snapshot of the Tasmanian ICT Workforce



Number of Tasmanian technology workers 2018

7265

	Computer design and related services	2292	(5)	Financial and insurance services	198
	Public administration and safety	1003	醫	Manufacturing	186
(Z)	Telecommunications services	980		Retail trade	145
	Other professional, scientific and technical services**	849		Other services	124
	Education and training	491		Construction	84
	Electricity, gas, water and waste services	300	<u></u>	Internet services providers, web search portals and data processing services	61
	Arts and recreational services	245	SALE	Internet services providers, web search portals and data processing services	61
₩,	Healthcare and social assistance	215		Other information media and telecommunications*	33

2018 completions



UTAS ICT undergraduate courses

VET ICT courses

410



UTAS ICT postgraduate courses

159

243

Source: Deloitte, 2018, ACS Australia's Digital Pulse, Deloitte, 2019, ACS Australia's Digital Pulse, uCube, NCVER Data – VET Students and Courses (National Centre for Vocational Education Research, 2019)

^{*}Excluding telecommunications services, and internet service providers, web search portals and data processing services, which are separately identified as ICT industry subdivisions.

^{**} Excluding computer system design and related services, which is separately identified as an ICT industry subdivision.

Strategic priorities

The Tasmanian ICT workforce faces a number of emerging and ongoing issues and challenges.

The Working Group has identified a range of collaborative actions and partnered initiatives that will seek to address these challenges and achieve the following outcomes:

Stakeholder collaboration

Strengthened collaboration and coordination between Tasmanian industry, education and government stakeholders to effectively address the complex and rapidly changing nature of the digital economy and workforce.

Student engagement

Increased engagement of young students and their parents in the pursuit of ICT skills and careers, thereby ensuring the future of Tasmania's ICT supply pipeline.

Employment pathways

Improved education to employment pathways to ensure new workforce entrants are sufficiently prepared with job-ready skills and real world experience to transition into employment

Professional development

Enhanced career and professional development opportunities to support ICT professionals in continuing their careers in Tasmania and in adapting to changing technologies and skills needs.

Diversity and inclusion

Increased diversity of talent in the workforce with an improved understanding of gender imbalance and barriers to employment, and increased awareness and support of diversity and inclusion initiatives.

Strategic insight

Improved insight and shared understanding of how digital transformation is impacting skills and labour demand across the Tasmanian economy to support strategic planning and decision making.

Product alignment

Improved alignment of education and training products to the needs of Tasmanian industry, ensuring that curriculums remain relevant, fit for purpose and agile.

Skills investment

Increased investment in the digital upskilling and reskilling of workers, contributing to a larger, more flexible, skilled and sustainable ICT workforce.

Industry readiness

Enhanced industry readiness of digital transformation with improved understanding of emerging digital technologies and its impact on skills and workforce development.

Sector profile

Improved sector brand identity with an increased local, national, and international awareness of the breadth and depth of Tasmanian ICT talent and capability.

Action Area I: Collaboration and insight

To remain globally competitive, the Tasmanian economy needs an ICT workforce with the capacity, capability and diversity of talent to embrace emerging technologies and engage with the global digital economy.

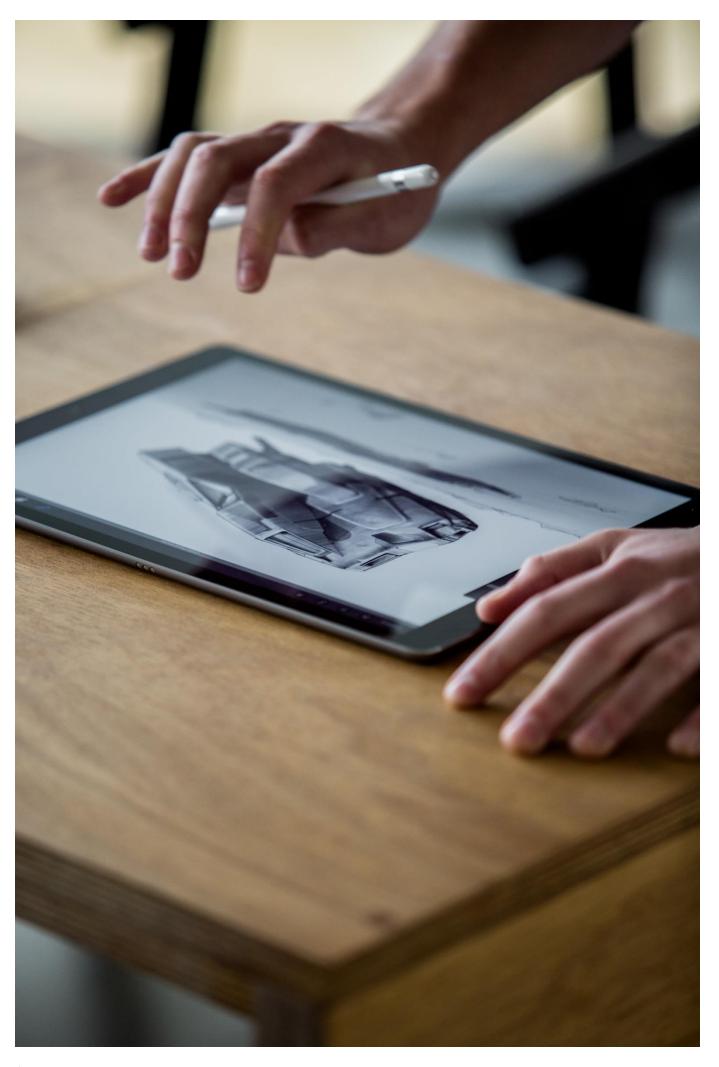
The adoption of emerging digital technologies is driving rapid increases and changes in demand for ICT skills.

The matching of supply and demand will be an ongoing challenge, with industry needs often changing faster than education providers can adjust their courses and content.

Developing a shared understanding and insight into how skills and labour demand is changing in response to digital disruption will be essential. This understanding will help industry and education stakeholders make effective strategic decisions about skills requirements, curriculum design, training and development, recruitment strategy and workforce planning.

Industry consultation has confirmed that improved collaboration and information sharing across Tasmanian industry, education and government stakeholders is a key strategic priority. Through effective collaboration and shared insight, stakeholders will be able to address the complex, multi-dimensional and cross-sectoral nature of digital transformation and its impacts on the ICT workforce.

- An ICT Workforce Advisory Committee will be established in the first quarter of 2020 to oversee the implementation of this plan and drive collaboration and information sharing across industry, education and government stakeholders.
- The Department of State Growth (DSG) will work with industry to publish an environmental scan and capability map of the Tasmanian ICT sector to deepen understanding of industry capabilities, export market involvement, and workforce outlook.
- Skills Tasmania will work with data and research providers to develop and promote data collection and analysis tools that will provide deeper insight into the Tasmanian ICT workforce and enable market participants to better respond to changing or emerging demand.
- The Australian Computer Society (ACS) and Skills Tasmania will actively engage with national groups such as Skills Australia, the ICT Industry Reference Committee (ICT IRC), the Australian Information Industry Association (AlIA) and the Foundation for Young Australians (FYA) to identify and understand emerging ICT skills and training issues, trends and reforms.
- TasICT and ACS will develop opportunities to engage with Tasmanian industry bodies to gain insights into the digital transformation needs and technology skills gaps of key industries.



Action Area 2: Capacity building

Building capacity in the Tasmanian ICT workforce means ensuring that Tasmania has a sufficient pipeline of technology professionals that can meet the demands of the digital economy.

With declining enrolments and low completion rates for VET and tertiary ICT courses, a key challenge for the supply pipeline is how to encourage more young Tasmanians to pursue an ICT education and career. Increased engagement of school students in technology through the delivery of high-quality programs, and making relevant and accurate information about ICT career paths readily available, will help strengthen the supply pipeline.

However, the supply of graduates must fit the needs of industry. Consultation has found that businesses are struggling to find suitably skilled talent, while at the same time ICT graduates are struggling to find employment. Industry feedback indicates that graduate job-readiness is an ongoing barrier, with employers seeking broader and more up to date skills, and increasingly favouring candidates with vendor certifications.

Strengthened partnerships between education and industry stakeholders that provide opportunities for curriculum co-creation, and deliver new models for work integrated learning and real-world experience, will enhance the quality and relevance of education and training products. This will ensure that ICT graduates possess the combination of technical and enterprise skills necessary to transition into the workforce.

- The Department of Education (DOE), in partnership with industry, will explore the development of a Packages of Learning pilot program for Years 9-10 focussed on the ICT industry.
- Industry and education stakeholders will support and develop ICT career expos and information events (such as Big Day In) to engage secondary students and their parents in ICT.
- The University of Tasmania (UTAS) will develop new programs and partnerships that bring leading local ICT companies and professionals with expertise in emerging digital technologies onto campus and into classrooms.
- 7 TasTAFE will enhance its ICT industry partnership programs, and through its Centres of Excellence and Industry Advisory Groups identify emerging digital skills gaps occurring across key industries.
- DOE will seek opportunities for industry aligned new course development for years 11 and 12, and promote exemplar industry-school partnerships (see Appendix 1).
- Skills Tasmania will work with industry in promoting greater investment in traineeships and apprenticeships in ICT through the Apprentice and Trainee Training Fund.
- UTAS in partnership with industry will co-design a new Work Integrated Learning Program incorporating the latest industry practices, frameworks and methodologies to support students in gaining real-life and relevant ICT industry experience.
- TasTAFE and Department of Premier and Cabinet (DPAC) will investigate opportunities to partner with industry to develop vendor based traineeship programs that combine Vocational Education and Training (VET) qualifications, industry-recognised certifications and paid on-the-job learning.

Action Area 3: Capability building

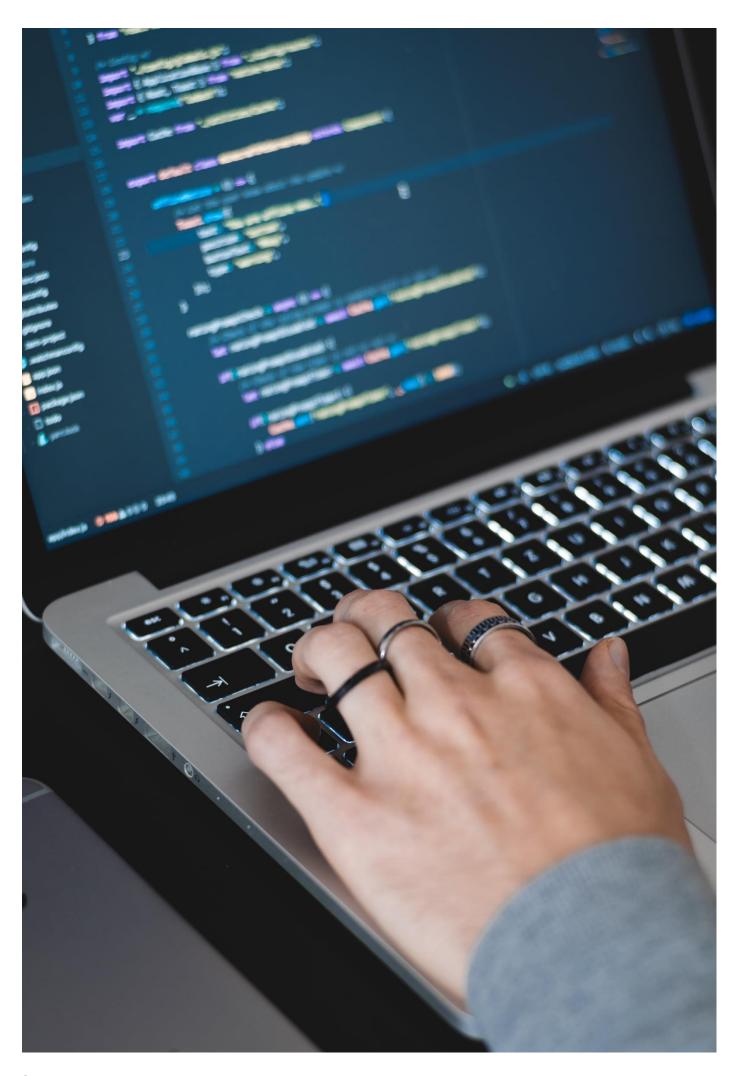
The increasing adoption of emerging technologies requires the ICT workforce to develop new skill sets and increasingly higher-level specialist capabilities. As a result, there is strong worldwide demand for professionals with skills and experience in areas such as cybersecurity, cloud infrastructure, machine learning and data analytics. Demand is also increasing for professionals that have both specialist technical capabilities and broad enterprise skills.

Building these capabilities across the Tasmanian ICT workforce will require business leaders to deepen their understanding of the digital skills landscape and commit to forward looking digital workforce development plans. Likewise, professionals will need to better understand specialist skills pathways and commit to ongoing professional development to keep up with technology trends.

Investment in workforce training and upskilling, and supporting career and professional development are key strategic priorities that if enhanced will help to underpin the capability of Tasmania's ICT workforce. Moreover these factors will help to retain high-calibre professionals in the state, and attract interstate and overseas talent.

In addition, encouraging new approaches to re-skilling within existing workforces and providing cross-sectoral pathways into ICT roles will contribute to a larger, more capable and sustainable workforce.

- TasICT and Skills Tasmania will actively promote funding initiatives, such as the Skills Fund, to encourage increased investment in the upskilling and reskilling of ICT workers.
- UTAS, in partnership with industry, will explore the development of a pilot 'technical pool' program that supports digital transformation projects via an on-demand talent pool of ICT graduates.
- ACS will develop a targeted local program to support ongoing professional development and mentoring of early-career ICT professionals.
- ACS and TasICT will explore the development of initiatives that support the transitioning and reskilling of workers from other sectors into ICT.
- As part of the Tasmanian Government's digital transformation strategy (Our Digital Future), DPAC will implement a range of initiatives across agencies to support the uplift of digital capabilities of the government's ICT workforce.
- ACS and TasICT will encourage the adoption of the Skills Framework for the Information Age (SFIA) to provide industry with a common language and consistent approach in identifying ICT skills gaps, assessing skills, and defining career and skills development pathways.
- UTAS in partnership with industry, will develop and launch short courses to support business leaders in developing a strategic understanding of Industry 4.0 technology and its impacts on skills and workforce development.



Action Area 4: Diversity and inclusion

Evidence is clear that workplaces that embody a diverse range of skills, backgrounds, cultures and perspectives lead to better organisational performance³. Diversity improves productivity, innovation and financial results.

Internationally, the participation of women in ICT roles remains significantly lower than it is in other professional occupations. Women represent 28 per cent of the Australian ICT workforce, compared with 45 per cent across other professional industries. Less than one quarter of Tasmania's ICT workforce is female, and reports show that by the time they have reached 15 years of age, the majority of girls have already dismissed ICT as a career option.⁴ Only 12 per cent of ICT workers are aged over 55, compared with 16 per cent across other professional industries⁵.

These under-represented groups are an untapped source of skills and experience that, if more engaged and better represented, will strengthen the capacity and capability of the Tasmanian ICT workforce.

Holistic and targeted solutions are needed that address the specific factors that create barriers for education and employment. Increasing the sector's engagement with under-represented groups, raising industry awareness and encouraging the adoption of workplace best-practices are key initiatives that will support a more diverse and inclusive workforce.

- ACS and TasTAFE will deliver the next stage of the Women in ICT Pilot Program. The 2020 program will support 25 female students to undertake a Certificate III in Information, Digital Media Technology, combined with work placements, professional development and mentoring support.
- ACS will publish an ICT sector diversity report based on action-research conducted over the life of the Women in ICT Program. The findings will provide a valuable evidence base to develop an on-going program, or to develop other similar programs that enables under-represented cohorts of the community to gain education and employment in the ICT sector.
- Industry and education stakeholders will develop and promote programs, such as the UTAS Women in Technology and Tech for Girls initiative, which inspire and encourage students to pursue an ICT education and career in technology.
- UTAS in partnership with industry and government will design a pilot program that supports employment and entrepreneurial pathways for international student graduates in ICT.
- TasICT and ACS will develop and promote best-practice industry resources, tools and initiatives to raise awareness and enable ICT sector employers to improve workplace diversity and inclusion.

³ McKinsey & Company, Delivering through Diversity, January 2018

⁴ Australian Computer Society, The Promise of Diversity: Gender Equality in the ICT Profession, 2015.

⁵ Australian Computer Society, Digital Pulse, 2019

Action Area 5: Profile raising

From recruiting early-career talent through to attracting international expertise, the ICT sector's profile and reputation plays a decisive role.

The Tasmanian ICT sector has a breadth and depth of talent, and compelling stories of success, that are not widely known outside the industry. Tasmanian technology entrepreneurs and ICT professionals are developing creative solutions and sophisticated, cutting edge technologies that compete on the world stage. The local technology community is vibrant, dynamic, interconnected and supportive.

A lack of awareness of these positive factors, and misperceptions that ICT occupations are dull and repetitive, are ongoing challenges for the sector. Developing a coordinated and targeted approach in improving public perceptions, and raising awareness of the wide range of career possibilities in ICT, will strengthen the future capacity and diversity of the supply pipeline.

In addition, raising the profile and image of the Tasmanian technology sector on a national and international stage will help to attract high-calibre talent, new business and investment into the state.

- Brand Tasmania will work with industry to develop a brand mission and vision to help guide how the Tasmanian technology community celebrates and shares it story.
- DSG will appoint a Technology Advocate that will work with industry to raise awareness of the Tasmanian technology brand and help promote Tasmanian technology products, services, and capabilities to the world.
- Industry and government will develop targeted initiatives, missions and campaigns to celebrate and promote Tasmanian technology success stories to inspire local students, encourage technology entrepreneurs, and attract new business, investment and talent to the state.



Action plan summary

Strategic priorities

Responsible

Department of Premier and Cabinet

Stakeholder	Strategic Insight	Student Engagement	Product Alignment	Employment Pathways	Skills Investment	Professional Development	Industry Readiness	Diversity and Inclusion	Sector Profile	✓ TasiCT	Australian Computer Society		< TasTAFE	Department of
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- I Establish an ICT Workforce Advisory Committee
- 2 Publish an environmental scan and capability map
- 3 Develop and promote workforce data and analysis tools
- 4 Engage with national ICT training and workforce groups
- 5 Develop cross-industry engagement opportunities
- 6 Explore the development of an ICT 'Package of Learning'
- 7 Develop and support ICT career expos and events
- 8 Enhance tertiary curriculum co-creation and co-delivery
- 9 Enhance VET curriculum co-creation and co-delivery
- Enhance school curriculum co-creation and co-delivery
- II Invest in ICT traineeships and apprenticeships
- Co-design a new Work Integrated Learning program
- Explore the development of vendor-based traineeship programs
- 14 Promote investment in ICT upskilling and reskilling
- 15 Design and run a pilot of the 'technical pool' program
- 16 Develop a mentoring and professional development program
- 17 Develop a program to promote cross sectoral pathways
- 18 Deliver digital culture and capability initiatives across government
- 19 Promote the adoption of SFIA capability framework
- 20 Develop Industry 4.0 technology short courses
- 21 Deliver the next phase of the Women in ICT Pilot Program
- 22 Publish an ICT sector diversity report
- 23 Develop and promote initiatives that engage girls in ICT
- 24 Design a pilot program that supports international student graduates
- 25 Develop industry best-practices and tools for workplace diversity
- 26 Develop a Tasmanian Technology brand and tool kit
- 27 Appoint a Tasmanian Technology Advocate
- 28 Promote and celebrate local technology success stories

Appendix I – Case studies

The Women in ICT Pathways Program

The Women in ICT Pathways program is a new collaboration between TasTAFE and the Australian Computer Society. By removing barriers to participation and strengthening the links between education and employment, this pilot project aims to encourage more women into Tasmania's ICT industry.

Over the course of two years, 36 Tasmanian women are being supported to complete a Certificate III in Information, Digital Media and Technology. This course has been specifically designed to support a diverse range of women, including school leavers and women seeking a career change or return to the workforce.

As a means of creating a practical connection between their study and future work outcomes, participants will also be paired with an industry mentor and given the opportunity to undertake professional development training.

An innovative example of industry-driven research in action, this program will create an evidence base to support the further development of initiatives promoting diversity in the ICT sector.

DXC and TasTAFE Partnership

When global IT services company DXC Technology made the decision to expand their presence in Tasmania, they were faced with a common challenge: while DXC had the means and motivation to employ locally, they were having troubling sourcing suitable candidates.

To combat this shortfall, DXC formed a partnership with TasTAFE to develop the Certificate IV in IT Support. Designed specifically to suit an IT outsourcing environment, this course is coupled with a student placement program that provides real-world training in IT support and customer service.

Graduates emerge from this program work-ready. They have been trained to global IT outsourcing standards and, through their placement experience, have the soft skills and confidence to succeed in the job market.

Through their collaboration, DXC and TasTAFE have created benefits for both students and employers, and contributed to the growth of Tasmania's technology community. As a successful example of partnership across industry and education, this initiative will serve to inform the development of future programs and services.

Burnie Primary's Coding, Arts and Robotics program

Through a partnership with Apple, Burnie Primary School has been able to deliver high quality Science, Technology, Engineering, the Arts and Mathematics (STEAM) education to the next generation. Every week, students at Burnie Primary have the opportunity to enter the Makerspace and design and build their own technological creations through the Coding, Arts and Robotics program (C.A.R.)

Students develop their coding skills using Apple's Swift Academy learning platform to create programs that make robots walk and drones fly. The hands-on approach shows how programming and engineering concepts take shape in the physical world.

The C.A.R program allows students to identify their personal interests, values, strengths and aspirations as they develop the knowledge and skills to make decisions about their future learning, work and life opportunities. The program is nationally recognised as an illustration of best practice and demonstrates the myriad benefits of early-education STEAM engagement

The Big Day In Junior event

In May 2019, Tasmania hosted its first Big Day In Junior event in Hobart. Described as a "full-scale professional conference" for upper primary students and their educators, Big Day In Junior is designed to spark curiosity in STEM career paths by offering students the chance to engage with technology in a way that is both tangible and entertaining. A national success story, Big Day In Junior is a branch of the larger Big Day In Project, as part of the ACS Foundation's internship program.

The result of this co-designed process is an accessible, hands-on event that showcases the strong link between technology and creativity. A Big Day In Hobart, aimed at school leavers and undergraduate students, is scheduled for 2020.

The introduction of Big Day In to Tasmania has opened up new doors for collaboration between education, government and industry, with 2019 exhibitors including the Australian Computer Society, WiseTech Global, Microsoft, Defence Force Recruiting and the University of Tasmania.

UTAS – Women in Technology Program

The Women in Technology Program, arranged by IT Services at the University of Tasmania, aims to promote the importance of a diverse workforce and to inspire, encourage and empower women and girls considering or building a career in technology.

Now in its third year of running, the program delivers a series of events that promotes discussion about women working in technology-related fields, provides experienced and leading female voices from the technology sector to share their career journey and learnings.

The program includes the Tech for Girls initiative which each year invites girls in years 7-12 to the university's A-Lab to interact with cutting edge technology, including robotics, virtual reality and 360 degree photography. The students are also provided with the opportunity to hear from successful women leaders about their professional journey in technology and related fields.

LiveTiles and Bayview Secondary College

Bayview Secondary College has partnered with LiveTiles to deliver courses on user-centred design methodologies. LiveTiles is a global enterprise software company born in Australia and head quartered in New York. The company's Hobart based product development team is passionate about inspiring the next generation of Tasmanian design and technology professionals.

The course LiveTiles delivers helps students gain skills and knowledge to approach creative thinking, problem solving and design. During the course students work through identifying problems that they experience in their day-to-day lives and explore how they could solve those problems using digital technology. Students learn the processes, methodologies and ways of thinking, such as rapid ideation and sketch proto-typing, that leading technology companies use to design new user-cantered products and services. This unique partnership allows students to access industry knowledge, skills, and trends that are unparalleled in other secondary education courses. It is an exemplar of industry and education partnerships that can deliver highly relevant and practical knowledge for students while inspiring them to pursue STEM related subjects and careers.





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