Changing the Design of TAFE for a New Normal

How Digital is Transforming the Training Experience,
Campus Design and TAFE Operating Models

VECTOR
consulting

Vector Consulting was commissioned by Cisco and Optus to understand how digital is changing TAFE operating models, training experiences and campus design. The study involved desktop research, targeted interviews, an international higher education roundtable and a comprehensive online survey that captured responses from the sector.

5 out of 7

Australian TAFE systems responded

BREAKDOWN OF RESPONDENTS BY JOB ROLE

41% Technology

29% Commercial / Strategy

24% Learning

6% Other

Executive Summary

COVID-19 has amplified major shifts impacting on TAFEs…

Rise of blue tech skills and forecast industry shortages

Higher value placed on digital skills for all roles

Changing training consumption models for both industry and learners

More 'digitally demanding' students

Efficiency agenda of state governments

The digitisation of every TAFE function
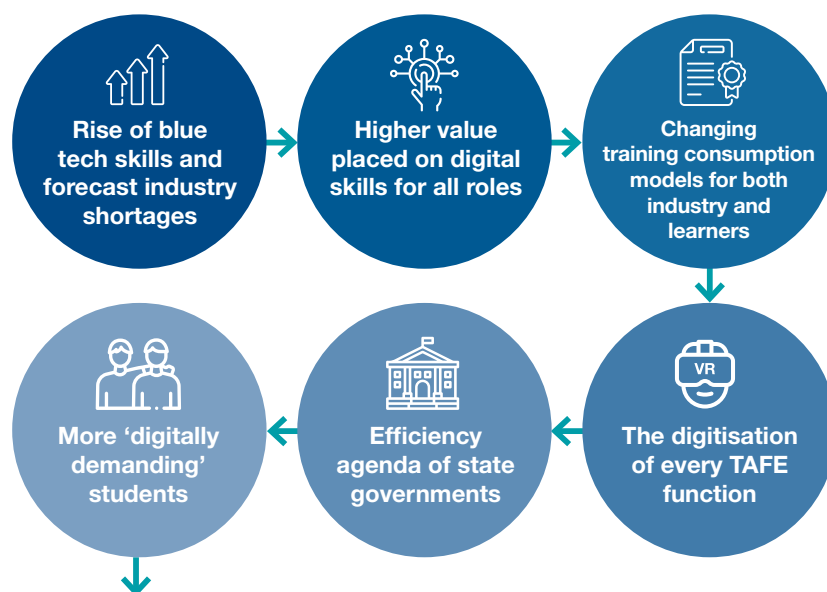
Creating the impetus for transformation of TAFE operating models, training experiences and campus design across five areas:

| 1. Creating institute resilience and adaptability | 2. Prioritising safety and security as part of the campus experience | 3. Re-designing campuses so they are engaging but efficient to operate | 4. Building learning models that are immersive and scalable | 5. Using innovative models to ensure TAFE boundaries are even more porous to industry |

To succeed in the 'new normal' and reinvigorate the TAFE brand, institutions need to:

Step 1 — Make digital an executive-level priority

Step 2 — Get the underlying platform in place: robust, scalable and secure

Step 3 — Focus on applications that make TAFE attractive to all students

Step 4 — Embrace partnerships with industry

Step 5 — Think strategically about how to fund digital initiatives in a financially constrained environment

Why does TAFE need to accelerate transformation?

COVID-19 has amplified some major shifts impacting on TAFEs

The rise of blue tech skills and forecast industry shortages

As industry accelerates adoption of technology there is a rising tide of 'blue tech' or digital trades (technology-intensive jobs requiring sub-degree level qualifications) – the traditional role of TAFE.[1] Demand for these skills will be particularly acute in sectors that are growing as a result of technological change including healthcare, wholesale/retail, professional services and technology (which are expected to add 280,000 new Australian jobs over the next 10 years).[2]

Higher value being placed on digital skills for all roles

59% of the forecast skills gap in 2027 will be in digital skills relevant to most roles such as technology design, operations and systems analysis.[3] Australian TAFEs increasingly play a role in equipping learners with these skills to ensure they graduate job-ready.

Changing training consumption models for both industry and learners

There has been a recent and rapid proliferation of micro-credentials within the training sector. Micro-credentials are becoming a way of reaching new student cohorts and delivering industry curricula either as sub-components of formal qualifications or as part of the lifelong learning journey.

More 'digitally demanding' students

Today's students are digital natives. They expect new and innovative services that make learning more engaging and flexible. This is creating challenges for TAFEs that increasingly need to keep pace with technology advances, including mobile, to provide personalised and engaging training.

Efficiency agenda of state governments

There is an expectation that TAFEs will deliver more with less given state government fiscal positions in the wake of COVID-19. TAFEs are needing to put greater focus on efficiency and maximising use of infrastructure including campus buildings and assets.

The digitisation of every TAFE function

Teaching and learning is being reimagined through digital collaboration and new and immersive technologies such as Augmented Reality and Virtual Reality. In addition every aspect of administration – from enrolment to onboarding, student information, timetabling and communication – is being transformed and made more seamless with digital.

1. TAFE Directors Australia, Cisco and Optus. 'Critical Role of Blue Tech and Digital Skills in Australia's Economic Recovery'. (August 2020). https://treasury.gov.au/sites/default/files/2020-09/115786_CISCO.pdf
2. Oxford Economics. 'Technology and the Future of Australian Jobs: What will be the impact of AI on workers in every sector?'. (November 2019).
3. Cisco. 'How Technology Will Affect U.S. Jobs Over the Next 10 years.' (September 2019). https://www. cisco.com/c/en/us/about/csr/research-resources/ai-usjobs.html

TAFEs will not return to pre-COVID 'normal'

More than four out of five TAFE executives believe COVID-19 has created permanent change in the way TAFE campuses are designed and operate. This is higher than the equivalent figure for universities. TAFE strategy is changing in the following crucial areas.

1. **Creating institute resilience and adaptability**	**COVID-19 highlighted the importance of being resilient to shocks and able to adapt business and operating models. Institutions are now preparing their organisations to respond to future, unforeseeable shocks.**
2. **Prioritising safety and security as part of the campus experience**	**There is increasing focus on promoting safety and wellbeing on and off campus. This extends well beyond physical environments and includes efforts to protect student data at all costs.**
3. **Re-designing campuses so they are engaging but efficient to operate**	**Financial pressures are forcing TAFES to reduce operating costs including by using data and automation to drive efficiency. Many are having to make major investments in underlying digital platforms to flex and respond.**
4. **Building learning models that are immersive and scalable**	**TAFEs need a technology environment that helps them move from lagging to leading in preparing students for a digital workplace. For example, it's no longer good enough to have content online and available. The focus is shifting towards use of VR and AR to make learning more engaging and impactful, including simulations, which are particularly effective for TAFE.**
5. **Using innovative models to ensure TAFE boundaries are even more porous to industry**	**TAFE has been differentiated by its connection with industry but that relationship needs to be even tighter. This includes engaging with startups and entrepreneurs as well as multinationals and established SMEs.**

1. A focus on institute resilience and adaptability

What's happening and perspectives of the sector

While TAFEs could not have anticipated the sort of changes COVID-19 brought, institutes are asking themselves how they can be better equipped to deal with future shocks and the threat posed by cyber attackers.

The focus for TAFEs is how to sustain business continuity and system uptime in periods of crisis. Secure and scalable infrastructure (including networks) help institutions to flex with demand and add services as required, such as the mass migration to working from home that occurred during COVID-19.

Infrastructure also needs to be responsive to new security demands, for example the adaptation that occurred when staff working from home used their own devices from their unsecured home networks.

Institute resilience is at the forefront of TAFE leaders' minds
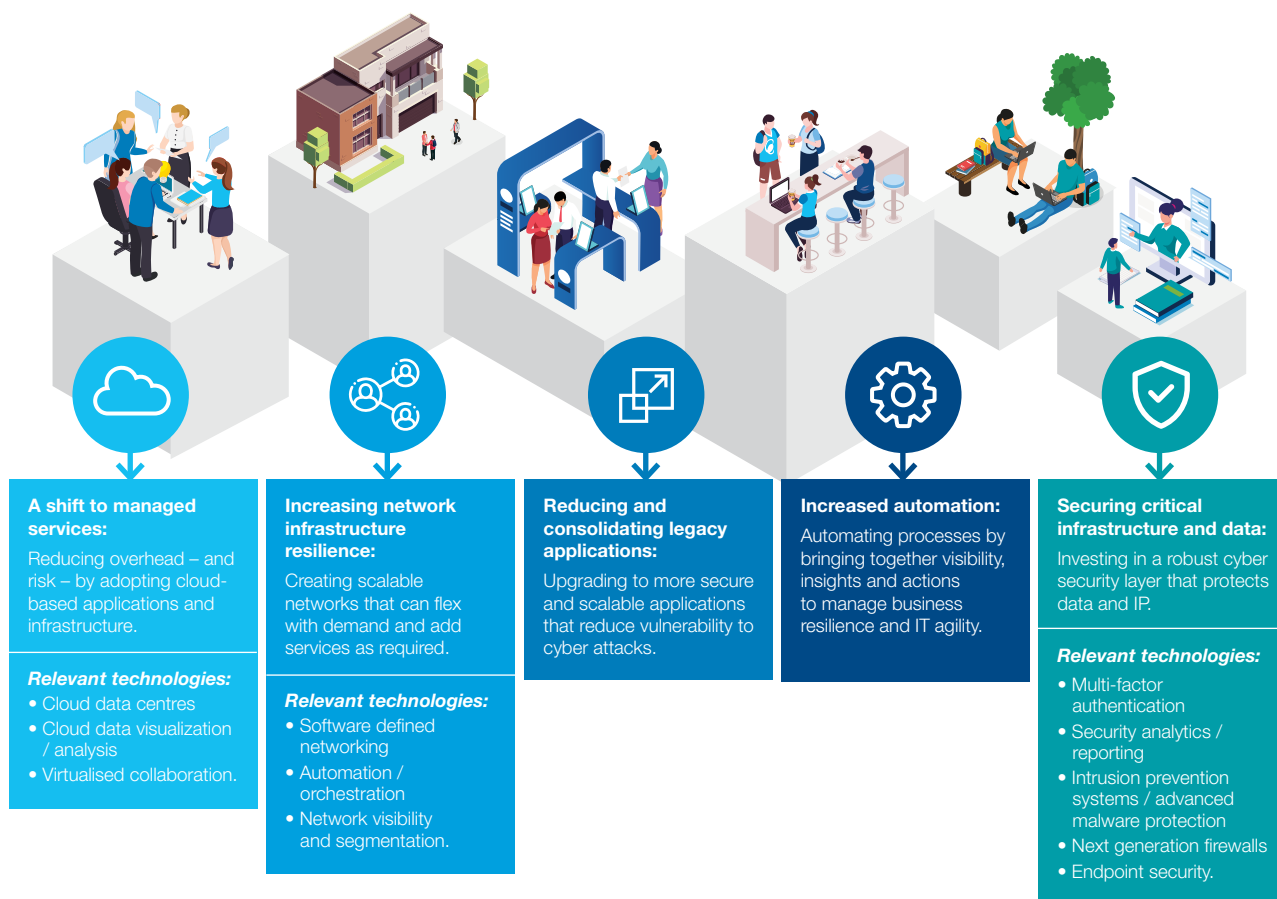
82%

of TAFEs say infrastructure that is dynamic and resilient to future crises is a priority

Working from home will continue to expose TAFEs to cyber vulnerabilities

1.1

Average number of additional days staff work from home since campuses reopened

Specific technology trends

A shift to managed services:

Reducing overhead – and risk – by adopting cloud-based applications and infrastructure.

Relevant technologies:
- Cloud data centres
- Cloud data visualization / analysis
- Virtualised collaboration.

Increasing network infrastructure resilience:

Creating scalable networks that can flex with demand and add services as required.

Relevant technologies:
- Software defined networking
- Automation / orchestration
- Network visibility and segmentation.

Reducing and consolidating legacy applications:

Upgrading to more secure and scalable applications that reduce vulnerability to cyber attacks.

Increased automation:

Automating processes by bringing together visibility, insights and actions to manage business resilience and IT agility.

Securing critical infrastructure and data:

Investing in a robust cyber security layer that protects data and IP.

Relevant technologies:
- Multi-factor authentication
- Security analytics / reporting
- Intrusion prevention systems / advanced malware protection
- Next generation firewalls
- Endpoint security.

Benefits

✓ **Maintains business continuity for critical systems**

✓ **Reduces complexity in IT environments, enabling greater automation and flexibility**

✓ **Protects institutes' data assets from the risk of cyber attacks**

✓ **Provides ability to rapidly innovate and respond to new training delivery demands**

✓ **Ensures remote workers are supported to perform at their best**

Case study

George Brown College's Smart, Connected Waterfront Campus Built on a Resilient Platform

George Brown College (GBC) in Toronto, Ontario, wished to create a highly integrated, technology-responsive building to eliminate barriers between disciplines such as nursing, dental health, and health sciences management. GBC partnered with Cisco and EllisDon Corporation to embark on the construction of a 380,000 square foot waterfront campus. From the outset, the campus was designed to reduce IT complexity while providing a flexible platform to automate operations and applications.

The campus leverages Cisco Connected Real Estate solutions to converge disparate systems over a single building information network. Virtually every building system (including mechanical controls for HVAC, blinds, electrical controls for lighting, energy management by way of smart utility meters, access, communications and security systems) is controlled from anywhere, with any smart device. Building operations and security staff view and manage settings in real time as well as remotely.

1. A focus on institute resilience and adaptability
2. A safe and secure campus experience
3. Re-designing campuses to drive efficiencies
4. Investments in immersive and scalable learning
5. Creating porous boundaries to industry

2. A safe and secure campus experience

What's happening and perspectives of the sector

COVID-19 has made employers more aware of physical and mental health risks to staff and students. TAFEs spent months forging new procedures and policies for the safe return to campus and are contemplating ways to use clever design to help manage anxiety, including digital tools.
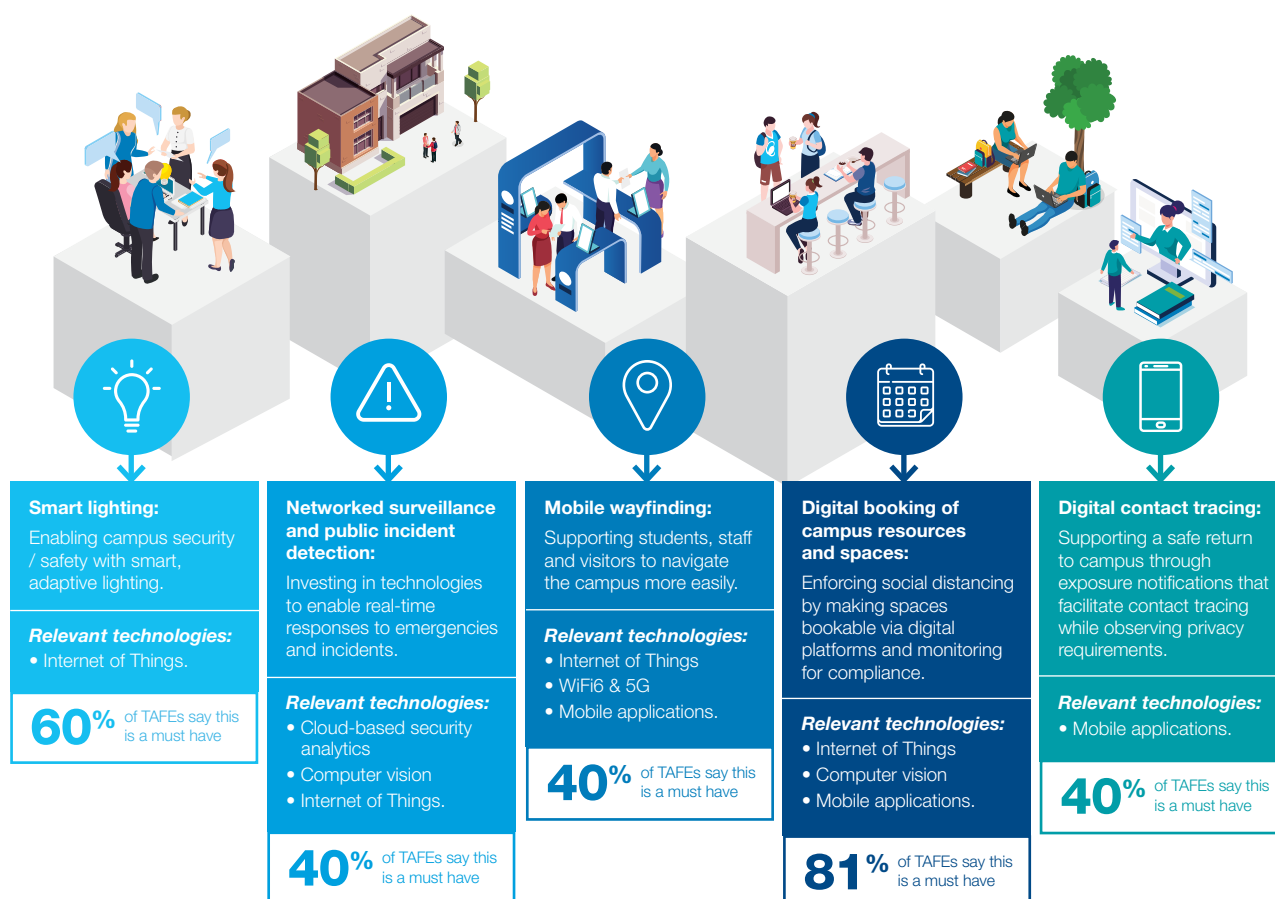
Health and safety is driving campus design

88%

of TAFEs say health and safety will be a more important driver of campus design

65%

of TAFEs say campuses designed to reduce stress and anxiety are a priority

Specific technology trends

Smart lighting:

Enabling campus security / safety with smart, adaptive lighting.

Relevant technologies:
• Internet of Things.

60% of TAFEs say this is a must have

Networked surveillance and public incident detection:

Investing in technologies to enable real-time responses to emergencies and incidents.

Relevant technologies:
• Cloud-based security analytics
• Computer vision
• Internet of Things.

40% of TAFEs say this is a must have

Mobile wayfinding:

Supporting students, staff and visitors to navigate the campus more easily.

Relevant technologies:
• Internet of Things
• WiFi6 & 5G
• Mobile applications.

40% of TAFEs say this is a must have

Digital booking of campus resources and spaces:

Enforcing social distancing by making spaces bookable via digital platforms and monitoring for compliance.

Relevant technologies:
• Internet of Things
• Computer vision
• Mobile applications.

81% of TAFEs say this is a must have

Digital contact tracing:

Supporting a safe return to campus through exposure notifications that facilitate contact tracing while observing privacy requirements.

Relevant technologies:
• Mobile applications.

40% of TAFEs say this is a must have

Benefits

✓ **Improves student wellbeing through a safer and more secure learning environment**

✓ **Increases capacity to attract students with downstream revenue upside**

✓ **Improves student retention, leading to better student and job outcomes**

✓ **Improves engagement between staff, industry and communities interacting on campus and virtually**

Case study

TAFE NSW: Cyber Security

TAFE NSW is the largest vocational education and training system in Australia with over 130 campuses state-wide. Given the scale of the system it was critical that data and systems were highly secure, particularly as TAFE NSW deepened its course offerings in information and communication technology, and cyber security specifically.

TAFE NSW worked with Cisco to deploy an integrated set of cyber security measures including firewalls, endpoint security, email security, identity services engine, secure network and malware analytics and advanced tetration. The integrated approach provides TAFE NSW with a high level of protection but also increases its flexibility to scale up and down and add services without compromising security.

3. Re-designing campuses to drive efficiencies

What's happening and perspectives of the sector

State budgets are being squeezed to fund COVID-19 stimulus measures, forcing TAFEs to continually look for sustainable cost savings. Areas like energy usage, space and asset utilisation and lifecycle management offer potential savings but investments in digital are generally required to capture those savings.

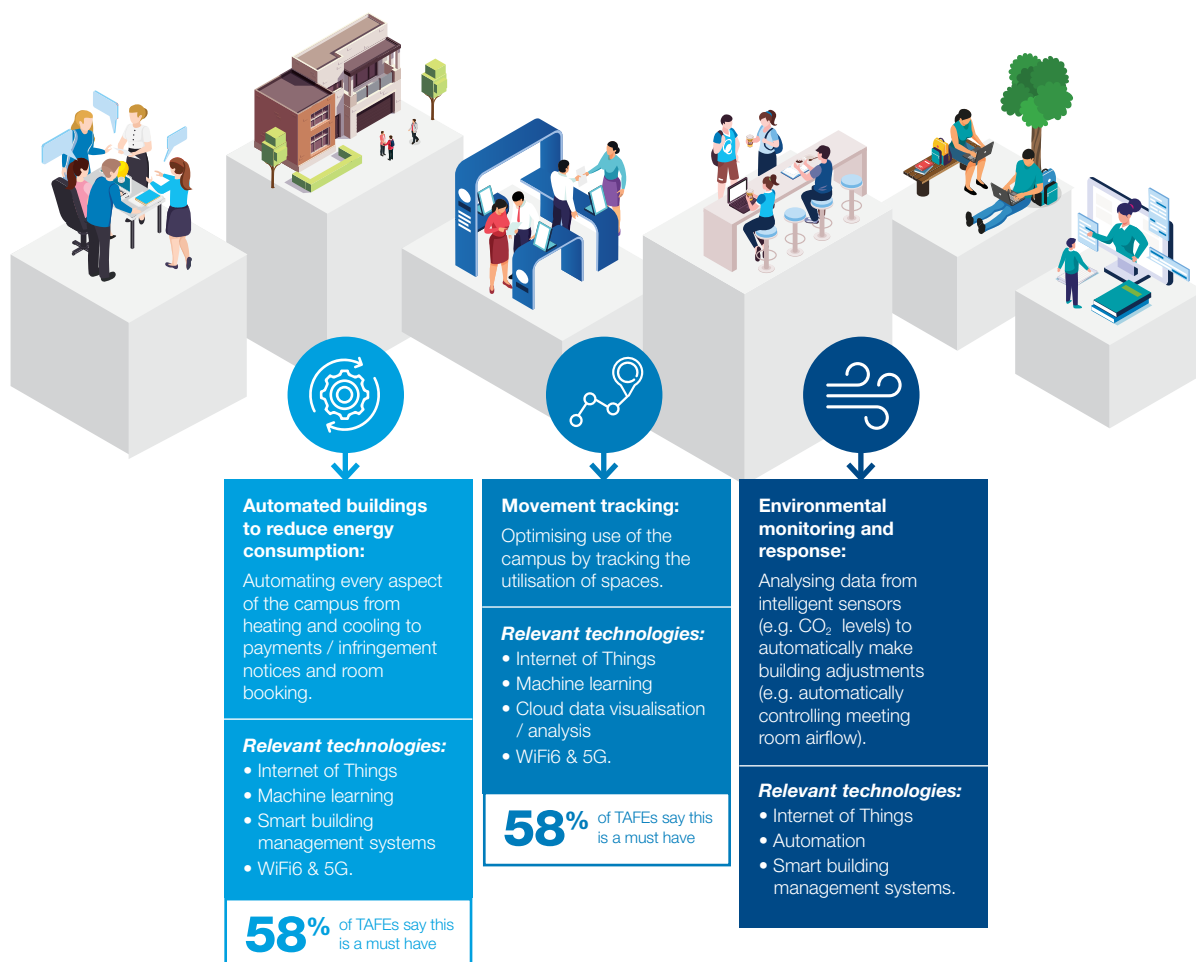**Reducing the cost of campus operations is a major priority**

82% of TAFEs say campuses that are cheaper to build, fit out, operate and maintain are a priority

81% of TAFEs say they will be more focused on reducing operational costs and finding campus efficiencies

Specific technology trends

Automated buildings to reduce energy consumption:
Automating every aspect of the campus from heating and cooling to payments / infringement notices and room booking.

Relevant technologies:
• Internet of Things
• Machine learning
• Smart building management systems
• WiFi6 & 5G.

58% of TAFEs say this is a must have

Movement tracking:
Optimising use of the campus by tracking the utilisation of spaces.

Relevant technologies:
• Internet of Things
• Machine learning
• Cloud data visualisation / analysis
• WiFi6 & 5G.

58% of TAFEs say this is a must have

Environmental monitoring and response:
Analysing data from intelligent sensors (e.g. CO_2 levels) to automatically make building adjustments (e.g. automatically controlling meeting room airflow).

Relevant technologies:
• Internet of Things
• Automation
• Smart building management systems.

Benefits

✓ **Reduces operating costs, enabling working capital to be applied to higher value functions**

✓ **Reduces environmental footprint and energy usage**

✓ **Generates potential for better, more engaging learning and working experiences**

Case study

Holmesglen using digital to drive student engagement and remove friction

Holmesglen Institute in Melbourne is Australia's largest stand-alone TAFE provider with a diverse course offering. Holmesglen recognised that digitising a number of student services would help to streamline student access to critical services. Holmesglen deployed the Involvio system with a specific focus on in helping students navigate campus, access their timetables and student resources and to mark attendance.

Involvio was integrated with the Holmesglen timetabling and student information systems. For staff the system was used to create an on campus pass to assist with COVID compliance and enable a safe return to campus.

4. Investments in immersive and scalable learning

What's happening and perspectives of the sector

There is a major focus on moving teaching beyond the constraints of time and place; learning that can happen anytime, anywhere. Using the right video tools in the classroom along with video conferencing, digital content and engagement tools, an enriched learning experience that can be equally delivered to students in the classroom or remotely – as well as making learning available wherever they are at whatever time – is most convenient, in a manner that is secure and safe.

Immersive technology will impact every learning space

88%
of TAFEs say there will be more demand for smart classrooms

81%
of TAFEs say there will be more demand for immersive / simulated learning spaces

Specific technology trends

Digital collaboration:
Enabling students to interact with peers – and within teams – using digital technologies.

Relevant technologies:
• Digital collaboration
• Interactive whiteboarding.

100% of TAFES say this is a must have

Immersive learning spaces:
Adopting new technologies to deliver highly immersive and simulated learning experiences.

Relevant technologies:
• Virtual Reality
• Augmented Reality
• HD Video
• Speaker tracking
• Interactive whiteboarding
• 5G.

56% of TAFEs say this is a must have

Remote access to live classes, lectures and tutorials:
Making learning accessible anywhere and anytime irrespective of student geography.

Relevant technologies:
• Digital collaboration
• HD video
• Speaker tracking
• AI transcription.

94% of TAFEs say this is a must have

COVID-19 sparked a wave of innovation in collaboration technology

The future of digital collaboration technology will involve more blurring of the lines between the physical and virtual worlds. COVID-19 accelerated development of new features for digital collaboration tools, recognising that online delivery capability was a non-negotiable for most employers (including TAFE). Cisco, for example, has a vision to make the Webex experience ten times better than meeting in person. New features to collaboration technology include:

AI-based voice capabilities
Enhanced productivity with new Artificial Intelligence capabilities

Smarter meeting room devices
Connected smart room-based endpoints that make interaction with environments frictionless

Seamless user experience
New cross-platform integrations that create seamless user experiences (e.g. Microsoft Teams and Cisco Webex integrations)

Compliance and safety
Advanced analytics and applications that support safer work and learning environments

Data security
New data protection and secure collaboration capabilities that protect institutions' critical data and assets

Benefits

✓ Improving digital and employability skills such as collaboration and critical thinking

✓ Creating more engaging teaching experiences that lead to better learning and job outcomes

✓ Increasing accessibility of learning to a broader range of students, including remote cohorts

Case study

### Victoria University Polytechnic's Cybersecurity Training Centre

Victoria University Polytechnic, in partnership with Cisco and underpinned by Optus services, opened a Cybersecurity Training Centre in Melbourne's west. The centre is a response to the 18,000 additional cyber security workers who will be required by 2026.

The facility is designed to feel like an industry-standard security operations centre (SOC) to help students imagine themselves in the cyber security workplace. Learning spaces are equipped with leading-edge technology from Cisco, including immersive Webex Boards that allow students to seamlessly interact with industry and other experts.

Key facts

156%
Increase on new student numbers from Jan 2019 to Jan 2021
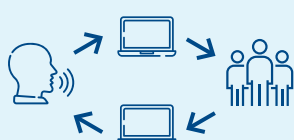
30 — Jan 2019
146 — Jan 2020
375 — Jan 2021
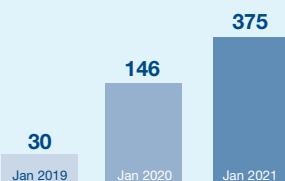
100%
Improvement on conversion of offer to enrolment from 2019 to 2021

80%
of program delivered remotely

5. Creating porous boundaries to industry

What's happening and perspectives of the sector

Closer integration with industry is an ongoing challenge for TAFE. As industries are digitised, the power balance of different sectors is changing and the role of SMEs and startups / entrepreneurs is making it harder for TAFEs to engage with a distributed employer base. TAFEs are having to make their facilities even more accessible to industry and invest in different products and services that leverage industry partnerships to drive benefits for students (e.g. micro-credentials, co-delivered courses, workplace-based training).

Industry will become a vital feature of future campuses

88% of TAFEs say campuses that are integrated into broader precincts (including industry and community) are a priority

69% of TAFEs expect more demand for industry partners to co-locate on campus

Specific technology trends

Creating industry experiences via digital platforms:

Enabling students to develop real-world, job-ready skills through digital collaboration.

Relevant technologies:
• Digital collaboration
• Virtual Reality
• Augmented Reality.

63% of TAFEs say this is a must have

Accelerating applied research with industry:

Transforming campuses into living labs that provide a testbed to develop and trial industry innovations in collaboration with researchers.

Relevant technologies:
• Digital collaboration
• Internet of Things
• Machine Learning
• Cloud data visualisation /analysis.

69% of TAFEs say this is a must have

1. A focus on institute resilience and adaptability
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Benefits

✓ **Exposing students and staff to industry experiences**

✓ **Increasing relevance to industry and improving job outcomes for students**

✓ **Increasing access to industry-leading innovations**

✓ **Generating potential for downstream research and commercialisation revenue**

Case study

Flinders at Tonsley

Flinders University's Tonsley campus is a hub of innovation and co-located with TAFE SA. Focus areas include computer science, artificial intelligence, defence and national securities, autonomous vehicles, information technology, engineering and mathematics.

Flinders at Tonsley hosts significant innovation assets including:

- TAFE SA (which is co-located at Tonsley)
- Cisco Innovation Central
- Flinders' Digital Health Design Lab
- The Line Zero – Factory of the Future testbed for modern manufacturing
- Cisco Networking Academy presence and curriculum co-design activities.

By co-locating teaching and research with key industry partners, Flinders at Tonsley acts as an innovation catalyst, connecting problems with solutions while providing students with access to real-world industry experiences. As an indicator of the precinct's success, there are now more people working at Tonsley than were employed at the car plant that previously occupied the site.

Roadmap for operationalising digital innovation

The capacity of TAFEs to adjust to these future changes and sustain innovation and future competitiveness is increasingly dependent on having a clear strategy for operationalising digital innovation. There are a range of steps TAFEs need to take.

Step 1   Make digital an executive-level priority

Institutions need to move from having a separate digital strategy to embedding digital in their overarching organisational strategy; ensuring that all infrastructure is digitised, whether it's a new building, precinct or other major civil works project. This invariably necessitates a shift in executives' focus – from digital as an augmentation tool to digital as a cross-cutting lever that enables TAFEs to innovate and respond to new demands in training. It also creates the impetus for a range of stakeholders to play an elevated role both in the design of campuses and broader institutional strategy – including CIOs, technology companies and architects with a strong understanding of digital.

87%
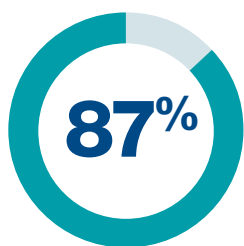
of TAFEs say the CIO will be a more influential voice in the strategy of the institution

67%
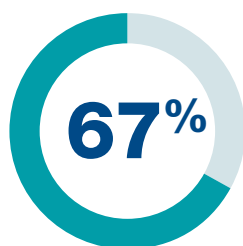
of TAFEs say architects with a strong understanding of how digital impacts on education will be in higher demand

47%
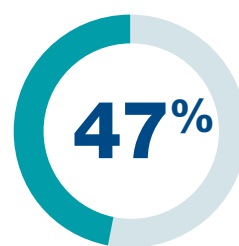
of TAFEs say technology companies will become more influential in the design of campuses

Step 2   Get the underlying platform in place: robust, scalable and secure

Building the right platforms is critical to providing the foundation for innovation and facilitating an automated, digital, resilient campus and hybrid learning. The importance of underlying infrastructure is borne out at the security layer. Internet security groups and governments have warned that cyber criminals are exploiting the disruption caused by COVID-19 to initiate a range of phishing and malware attacks, which are increasing in frequency, scale, sophistication and impact. TAFEs need to ensure platforms and infrastructure are secure by design, understand where exposure points exist, and address them. Physical and digital security should be built into the foundation, across both the campus and externally to remote staff and students.

Case study

Kangan Bendigo TAFE Campus

Kangan Bendigo TAFE Campus in the heart of Bendigo's CBD is undergoing a $60 million redevelopment project, with the aim of revitalising the campus and showcasing innovative training delivery. The redevelopment will help to create a collaborative, integrated campus that meets the needs of students, staff and the community.

Kangan Bendigo understood the importance of contemporary digital infrastructure to enable functions such as real time location systems grade wireless network coverage across the campus. Cisco and Optus - as well as other technology vendors - worked with Kangan Bendigo TAFE to inform the design of digital network infrastructure that would meet existing requirements and future-proof the campus. The digital infrastructure will enable Kangan Bendigo TAFE to continually innovate on its digital platform whether that be for campus operations or training delivery.

Step 3 — Focus on applications that make TAFE attractive to all students

Many students are preferencing university or going directly into employment over TAFE. For example, of 39,336 year 12 school leavers in NSW in 2018, 48.4 per cent went on to study for a degree at university, compared with just 17.2 per cent who began vocational education, including apprenticeships or traineeships.[1] To help catalyse a shift in the uptake of vocational education, TAFEs need to improve the attractiveness of their offering and differentiate on the quality of digital experiences.

With the underlying platform in place, TAFEs should focus on providing students with enriched experiences anywhere on and off-campus. Connected devices, analytics and automation combine to power services for students on-campus – from helping students find available study rooms to automatically optimising lighting to improve engagement, depending on the time of the day. Accessible learning content, delivered via innovative and scalable digital platforms, ensures that engaging learning experiences can extend beyond the campus. TAFEs need to ensure applications meet the ever-changing needs of the student cohort, including by adopting a mobile-first approach to technology investment and service delivery.
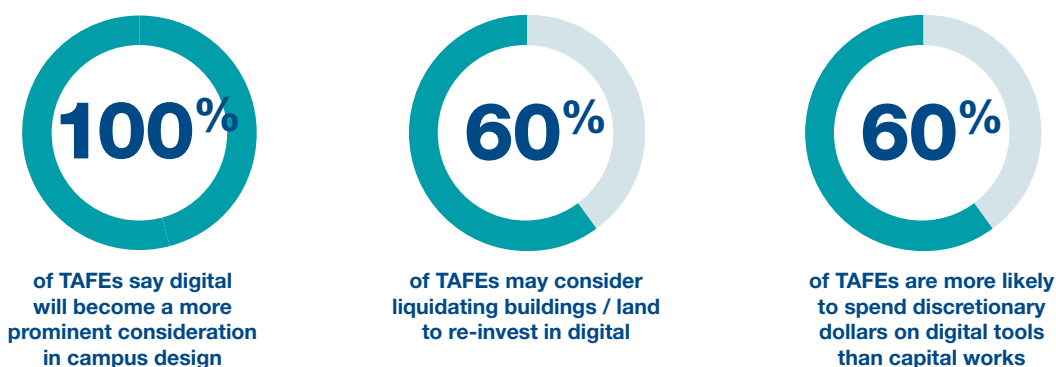
Step 4 — Embrace partnerships with industry

Partnerships are more critical and TAFEs need to look at what partners can bring beyond technology and equipment: skills, research and innovation, tech and skills transfer, thought leadership and global networks. For example, industry should be engaged to ensure that TAFE offerings meet current and anticipated labour market needs. Both the 'hard' and 'soft' employability skills need to be identified, taught and credentialled in a manner in which industry has confidence.

Optus and Cisco have a range of formal and informal mechanisms for collaborating with TAFEs on digital. Optus and Cisco have provided access to the HR function to identify not only what skills are in demand but how they use micro-credentials and mobile tools to train their own workforce. Cisco is also establishing Digital Future Learning Labs and Centres of Excellence in critical digital capability areas (such as cybersecurity) across Australian campuses. These physical hubs for digital capability provide practical, immersive, blue tech learning opportunities and create a platform for using digital to innovate and respond to new demands in training. Opportunities to leverage partnerships to inform campus design, student experience and contemporary learning are boundless.

Step 5 — Think strategically about how to fund digital initiatives in a financially constrained environment

In a rapidly evolving world, digital will continue to accelerate both in terms of its pervasiveness and importance. A major question for TAFEs is where funds will come from to invest in the type of aggressive digitisation that is forecast. In addition to cost-saving strategies (such as rationalising courses and better utilising existing space), expenditure has the potential to be supported by:

- Postponing capital works and re-allocating funds towards digital infrastructure and services
- Rationalising land / buildings and reinvesting cost savings in digital to augment core spaces
- Leveraging vendor finance options and as-a-service consumption models to fund investments.

100% of TAFEs say digital will become a more prominent consideration in campus design

60% of TAFEs may consider liquidating buildings / land to re-invest in digital

60% of TAFEs are more likely to spend discretionary dollars on digital tools than capital works

[1] Centre for Education Statistics and Evaluation, NSW Post School Destinations and Experiences Survey, 2019

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