The Tipping Point for Digitisation of Education Campuses

VECTOR consulting

Methodology

Vector Consulting was commissioned by Cisco and Optus to understand how universities and TAFEs are re-imagining teaching, research, administration and campus design. The study involved desktop research, targeted interviews, an international higher education round table and a comprehensive online survey that captured responses.

78%
Australian universities responded

5 out of 7
Australian TAFE systems responded

7 out of 8
G08 universities

4 out of 4
Australian Technology Network universities

5 out of 7
Innovative Research Universities

Breakdown of respondents by job role

- **55%** Technology
- **21%** Commercial / Strategy
- **19%** Learning
- **6%** Other

Percentages do not add to 100% due to rounding

Research commissioned by:

OPTUS

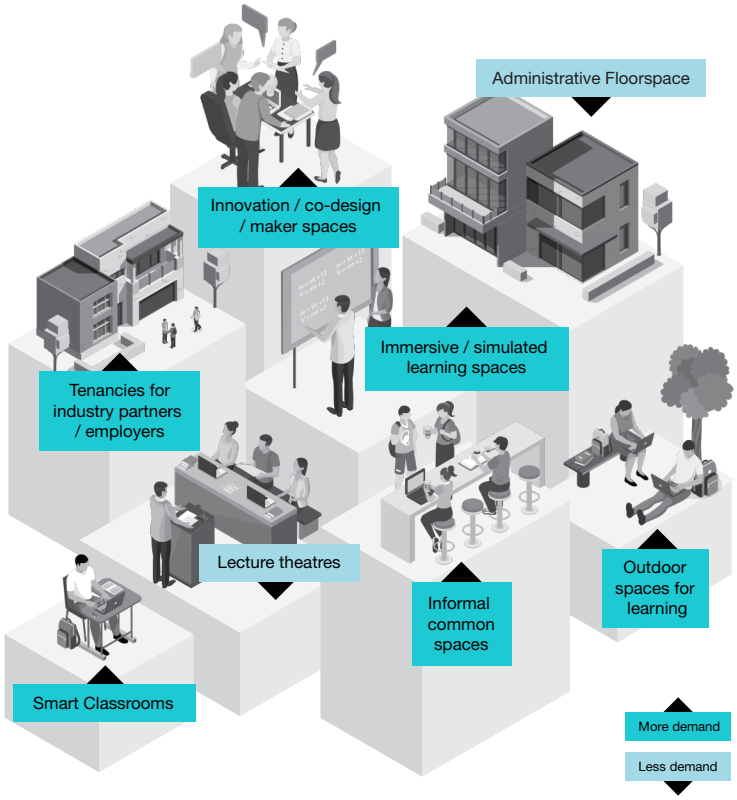
CISCO

Executive Summary

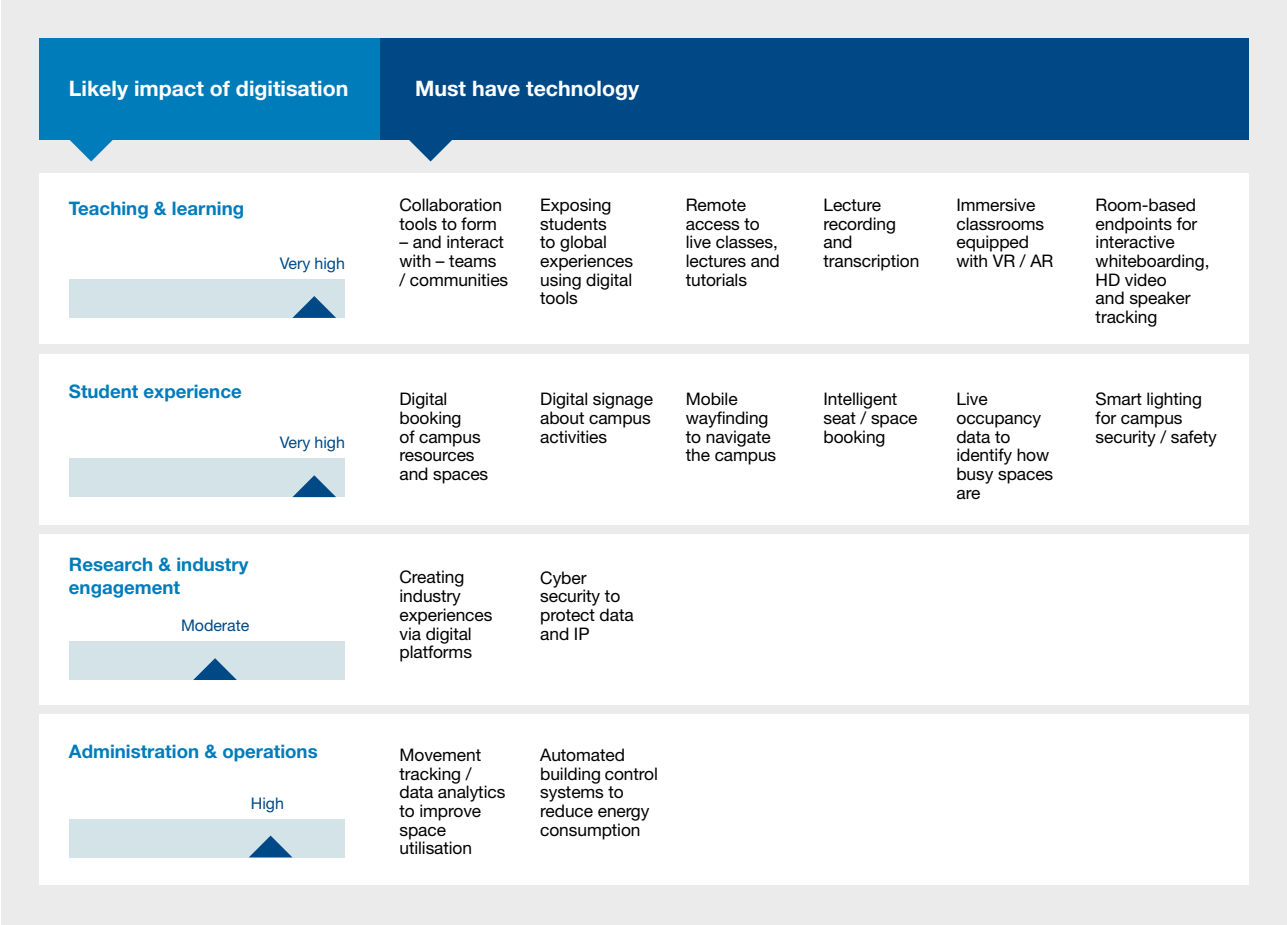
COVID-19 has had a profound impact on education. It has changed the student mix, created financial pressures and accelerated the transition to new working and learning models. A new set of drivers are emerging that will change how campuses look, function and create benefit.

Campuses are experiencing major change

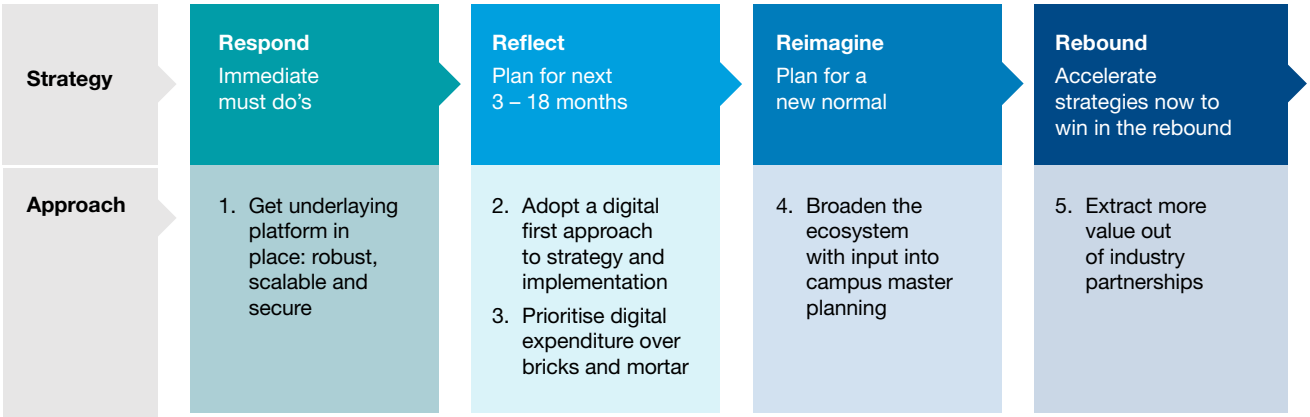
1. The future campus will have fewer people
2. The future campus will be more experiential and alive
3. The future campus will need to promote health and wellbeing
4. The future campus will have more porous boundaries to industry
5. The future campus will be more automated and efficient



It's not just campus spaces that are changing; all university functions are being reimagined, which is creating demand for new and expanded digital services in teaching, research and administration.



To navigate a 'new normal', institutions forecast they will need to accelerate investment in digital technology. Digital spending will increase by 11%, and 46% of institutions will consider liquidating buildings to free up resources. The digital-driven response will be guided by five recommendations.



1. COVID-19 will permanently change education and campus design

COVID-19 has put health systems at capacity, increased importance of governments, slowed world trade and movement, and affected every aspect of our day-to-day lives. Australia's higher and vocational education sectors have been particularly hard-hit. While institutions were quick to respond to the pandemic, closing campuses and moving to online learning quickly, the impact of the pandemic is likely to be profound and long-lasting:

A different student mix

16% drop in international student arrivals

Australian Bureau of Statistics, March 2020

Financial pressures

Projected **$19 billion loss** in the next 3 years

Mitchell Institute, April 2020

New learning models

"We're going to start reimagining what the learning experience is from an immersion point of view, and bring the digital and learning world into an integrated, immersive and interactive solution."

- Jason Cowie, CIO, Curtin University

New working models

Staff will work from home an extra **1.8 days** per week

Cisco and Optus, September 2020

A question on education leaders' minds is, **"What does the future look like for learning, research and campus design?"** The shared view is that institutions and the campus will never be the same again.

79% of education leaders believe COVID-19 will be looked back on as the tipping point for the way campuses are designed in the future

100% of education leaders believe digital will be an increasingly prominent consideration in campus master planning

87% of education leaders believe digital experiences will be a bigger determinant of whether students study and stay at an institution

74% of education leaders believe their institution is now more likely to spend discretionary dollars on digital platforms and tools than capital works

Education and training campuses will be changed in five fundamental ways:

Change 1
Fewer people on campus

Change 2
More experiential and alive campuses

Change 3
Promotion of health and wellbeing

Change 4
More porous boundaries to industry

Change 5
More automated and efficient campuses

Change 1 Campuses will have fewer people

The acceleration of remote working – alongside the continual rise of blended learning – will lead to more staff and students working and learning at home or in their local neighbourhoods.

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Fewer administration staff on campus

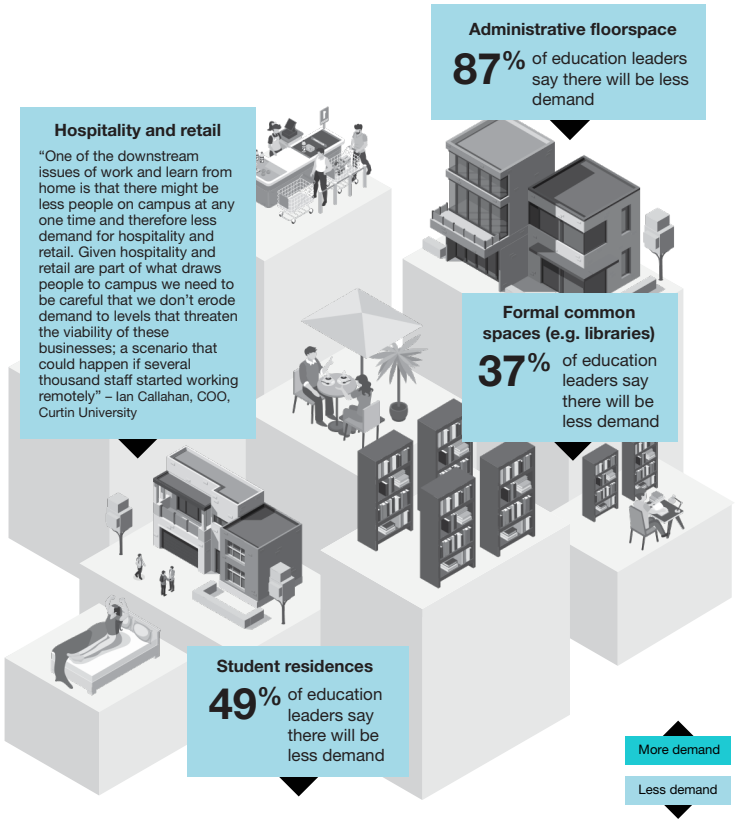
1.8

Average number of additional days administration staff will work from home

Fewer students on campus

94%

of institutions plan to make lectures and tutorials available remotely



However, this does not mean the physical campus is dead: bricks and mortar infrastructure will continue to anchor institutions' premium offering. The campus of the future will offer different benefits and appeal to different student cohorts:

Domestic school leavers will use the campus as a focal point for peer-to-peer connections

International students will use the campus to reinforce their immersive Australian experience

Mature students will have less need to be on campus but will still crave peer-to-peer connections

STEM-intensive students, who typically have high contact hours, will use the campus to access specialist equipment such as labs

"The campus plays a different role depending on the student. For some the campus is where they access specialist equipment while for others it's their focal point for connection to other students and the institution."

– Byron Collins, Executive Director, Business Services and Chief Technology Officer, University of Melbourne

Change 2 Campuses will be more experiential and alive

The campus will increasingly become a place for collaboration and peer-to-peer learning. This will drastically reduce demand for traditional spaces such as lecture theatres.

> " Lecture theatres will be used less. Students may come on site for an intensive two days a week, and do the rest of their learning wherever suits them."
> – Rob McGauran, Director, MGS Architects

> " Education is embodying Instagram – it's about creating and celebrating social moments with peers. There will still be bricks and mortar, but it's going to look very different."
> – Richard Leonard, Director, Hayball

> " The face to face mass lecture is all but dead; current technologies and new ways of engaging with content provide more varied opportunities for our students' learning outcomes."
> – Darren McKee, COO, Murdoch University

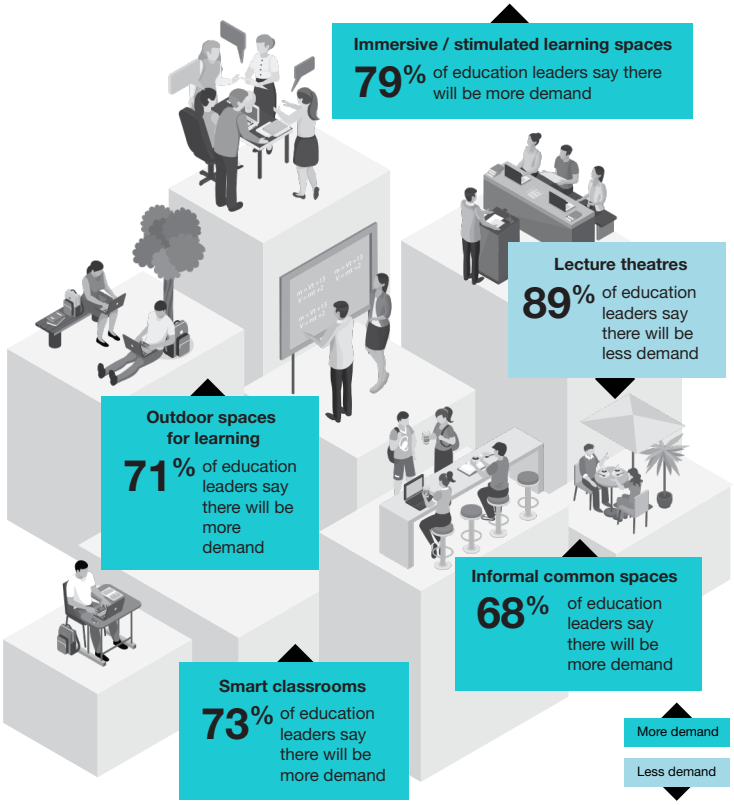
DRIVERS OF CHANGE

More focus on creating campus experiences

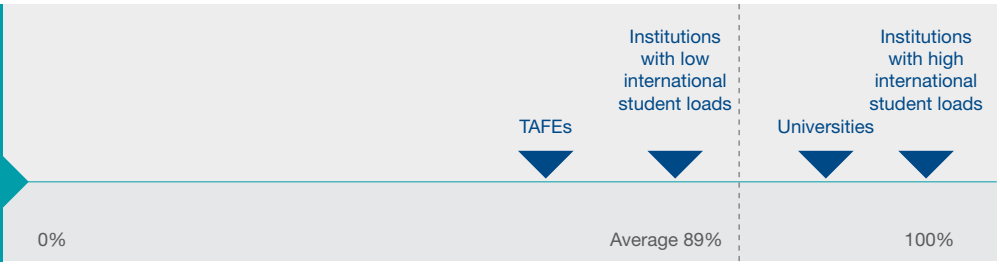
89%
of education leaders believe campuses will be designed to create memorable experiences that help students form closer relationships with peers and the institution

81%
of education leaders believe students will judge a campus by how 'alive' it is rather than the appearance and history of its buildings

54%
of education leaders believe students will increasingly be looking for 'Instagram-worthy' experiences on campus



Who says campuses will be designed to create memorable experiences that help students form closer relationships with their peers and institution?



Change 3 Campuses will be designed to promote health and wellbeing

Universities are collaborating to create healthier university campuses and communities[1] and COVID-19 has heightened the focus on health and wellbeing. In the short term, campuses will need to be more hygienic, facilitate social distancing and allow for effective contact tracing. There will also be a greater focus on mental health, as highlighted through modelling of national suicide prevention strategies.[2]

"There is real uncertainty about the future. How do we make environments that are calming, promote mental wellbeing and help people get outside more?" – Rob McGauran, Director, MGS Architects

DRIVERS OF CHANGE

More focus on campus health and safety

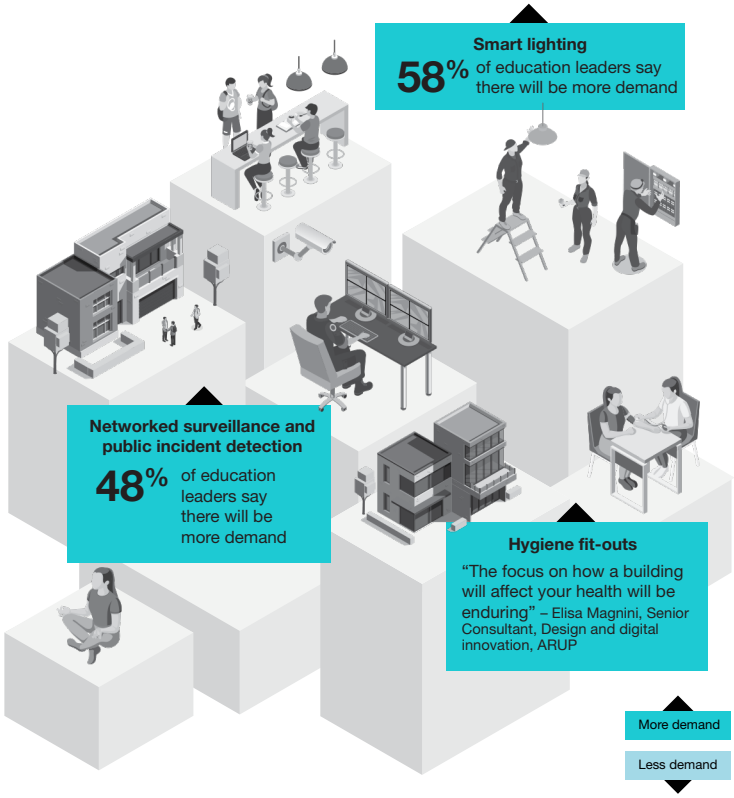
82%

of education leaders believe health and safety will be a more important driver of campus design

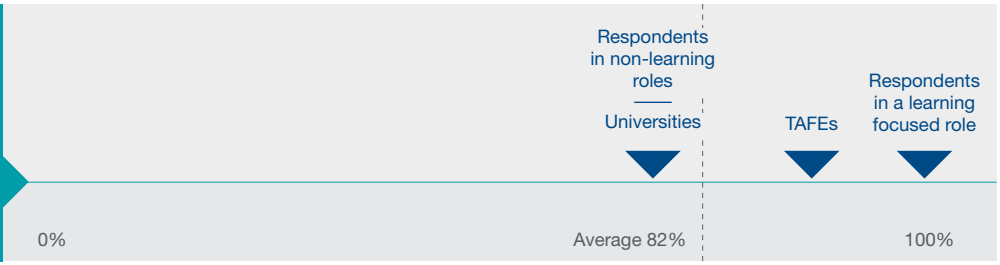
More focus on mental health

61%

of education leaders believe campuses will be designed to reduce stress and anxiety



Who says health and safety will be a more important driver of campus design?



Change 4 Boundaries will be more porous to industry

Universities and TAFEs are a product of where they are located as well as what they offer. There has been a major shift towards 'place-making' in higher education where businesses, researchers and students come together to create campus communities focused on common goals such as co-innovation.

DRIVERS OF CHANGE

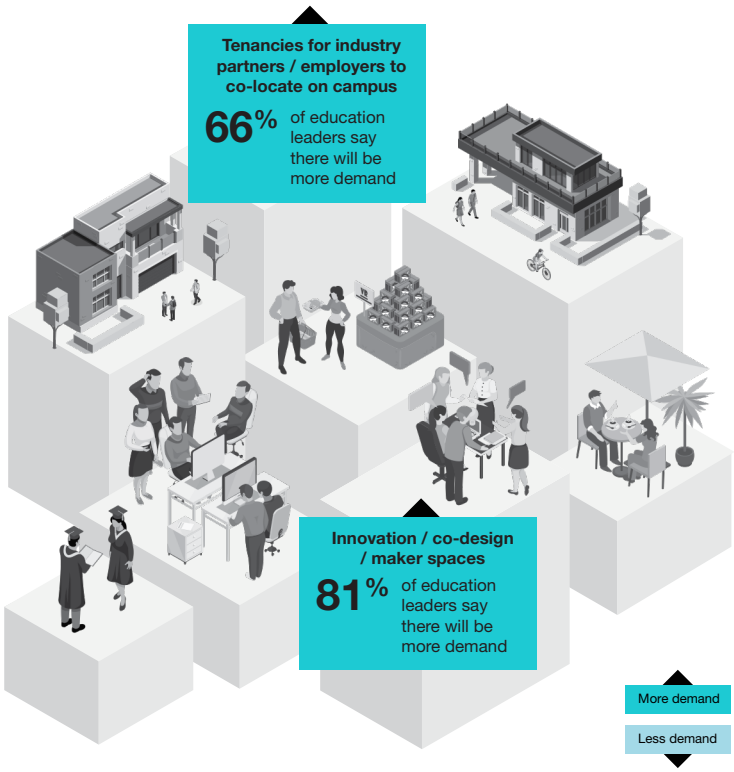
A focus on place-making

89%

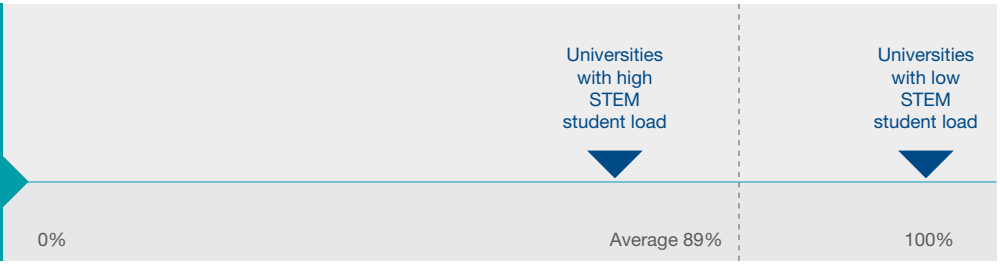
of education leaders believe campuses will be more integrated into broader precincts including industry and communities

22%

of start-ups are co-innovating with universities / research institutes



Who says campuses will be integrated into broader precincts?



"We are now reviewing what can we rationalise in terms of space and who we can attract to campus. Incubators, commercial space, government agencies, more student job-ready industry connections."
– Darren McKee, COO, Murdoch University

"Tapping into local players will become harder, particularly for CBD precincts where we are likely to see lower density. The institutions that succeed will do so by creating smart campuses that link to local incubators / innovation ecosystems."
– Richard Leonard, Director, Hayball

Change 5 More automated and efficient campus infrastructure

Reducing operational costs by finding campus efficiencies will become essential to offset a drop in student income and erosion of economies of scale (i.e. fewer people on campus). With greater budget scrutiny, investments will be prioritised towards initiatives that reduce recurring costs or generate incremental revenue. Campuses will be treated as microcosms of smart cities, which create opportunities for researchers and students to innovate and save money at the same time.

DRIVERS OF CHANGE

A focus on efficiency

$3B

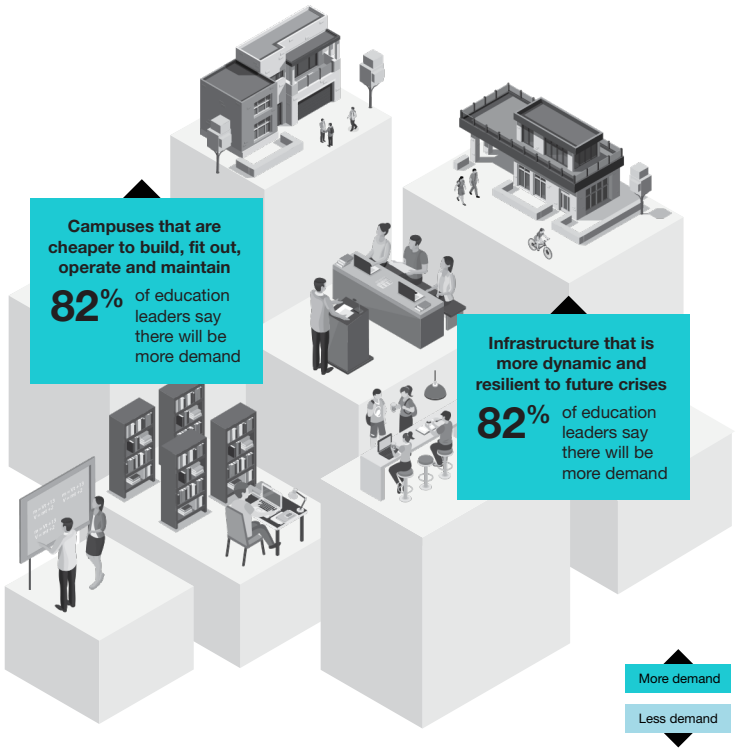
Drop in international student revenue in 2020

$12-18B

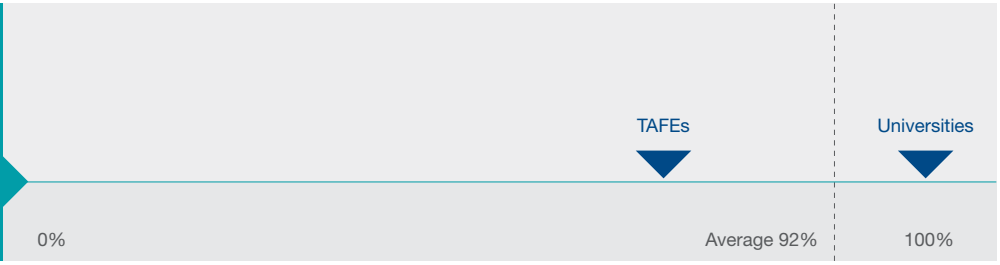
Forecast shortfall by 2024[3]

92%

of education leaders believe institutions will be more focused on reducing operational costs and finding campus efficiencies



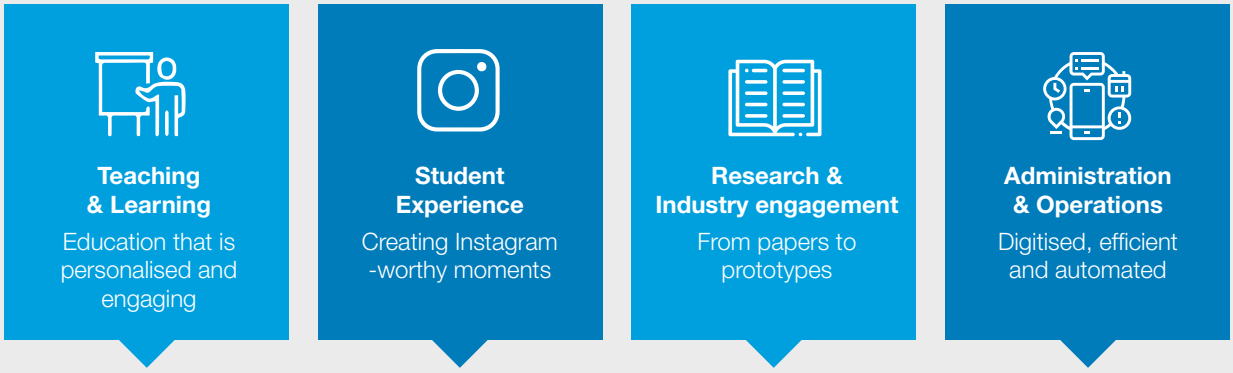
Who says there will be more focus on reducing operational costs and finding campus efficiencies?



2. Changing priorities will create demand for a new wave of digital services

All aspects of university and TAFE operations are being re-imagined. In most cases COVID-19 has accelerated or exaggerated trends that were already happening.

There is general agreement that these changes are driving institutions towards investment in digital.



Teaching and Learning

Education that is personalised and engaging

The core business of universities and TAFE was evolving well before COVID-19. The focus has been shifting towards learning that is customised to individual student needs and ability, and learning that more effectively prepares students for work. The future of education and campuses will be shaped by:

A. Personalised learning and authentic assessment

AI allows content and assessment to be delivered at scale and individualised. Learning will increasingly be self-paced and competency-based.

B. Collaborative learning

Collaboration is a human skill not easily replicated by machines. Employees are expected to work in teams so being job-ready in 2020 means being capable of working with people from different backgrounds, skillsets, demographics and cultures.

100%

Collaboration tools that allow students to form – and interact with – teams / communities*

> " Universities are talking about more online but augmented with peer-to-peer, digitally immersive experiences on campus including engaging with students on other campuses globally."
>
> – Rob McGauran, Director, MGS Architects

C. Focus on human skills and digital literacy

32% of the forecast skills gap in 2027 will be inherently 'human', relating to interpersonal communication, perceptiveness and persuasiveness. A further 59% of the forecast skills gap will be in digital skills relevant to most roles such as technology design, operations and systems analysis.[4]

50%

Exposing students to global experiences using digital tools*

*** % of respondents that said technology is a must have**

D. Learning that is accessible anywhere, anytime

The forced move towards remote learning as part of the COVID-19 response only reinforced the growing expectation that learning needs to be blended. The response also exposed major differences in the maturity and sophistication of institutions and challenged many to deliver high levels of student engagement while learning off-campus.

94%

Remote access to live classes, lectures and tutorials*

83%

Lecture recording and transcription*

> "The choice that staff and students have been afforded during COVID-19 will now be expected to be a retained BAU experience."
>
> – Michael Dean, CIO, South West TAFE

E. Immersive learning including gamification of education

It is no longer good enough to have content online and available. The focus is shifting towards use of VR and AR to make materials more engaging and impactful, including simulations, which are particularly effective in TAFE. The deployment of 5G will make VR and AR for learning a reality, enabling applications from virtual field trips to virtual classrooms to be delivered on-the-go with low latency. Gamification of learning is also being used to engage students, particularly the school leaver cohort, with 89% of learners believing it will boost their engagement.[5]

56%

Immersive classrooms equipped with VR / AR*

53%

Room-based end points that support interactive whiteboarding, high definition video and speaker tracking*

Student Experience

Creating Instagram-worthy moments

Students are increasingly expecting education institutions to mimic their digital experiences in other parts of their life: interactions with technology that are intuitive, rewarding and low touch. The experience extends beyond teaching and learning to include health and wellbeing, security and administrative tasks.

A. Friction-free interactions with the institution

Students want systems and applications to be intuitive and services delivered to them when they need them, and mostly via mobile device. Services with a premium on 'friction-free' include campus navigation, community building tools to help students connect, online resource reservations and density displays to show how busy spaces are.

81%

Digital booking of campus resources and spaces*

65%

Digital signage about campus activities*

62%

Mobile wayfinding to navigate the campus*

> "Students have experienced changed behaviours from COVID-19 and their expectations are changing as a result."
>
> – Bev Wright, CIO, University of Adelaide

B. Safe return to campus

The immediate priority is to safely bring students and staff back to campus while observing social distancing, hygiene requirements and other restrictions. Digital services include temperature declaration and symptom screening (making it possible for everyone on campus to complete a wellness check before they enter spaces), and positive diagnosis reporting and exposure notifications to facilitate contact tracing while observing privacy requirements.

61%

Intelligent seat / space booking*

51%

Live occupancy data for community members to identify how busy spaces are*

C. Student safety

Institutions are a microcosm of wider society and students need to be protected from violence, sexual harassment, bullying, racism and a range of other threats. Institutions are looking to technology to deliver networked surveillance, public incident detection and reporting, and smart lighting to improve campus security.

58%

Smart lighting for campus security / safety*

Research and industry engagement

From papers to prototypes

There is an increased expectation that research will create economic, social or environmental impact. Around 40% of research expenditure in 1992 was 'pure basic research' but this had fallen to 23% by 2016.[5] Australian competitive grants have continued to decline as a proportion of all R&D funds, from 18.1% in 2014 to 15.4% in 2016 to 14.6% in 2018.[7] A greater proportion of research conducted in universities – and all research conducted in TAFEs – is industry-driven. Traditional models are making way for more agile approaches that reflect how innovation is managed in industry, including by start-ups.

There is also an increasing focus on universities and TAFEs pursuing corporate training opportunities that diversify revenue streams.

A. Industry-driven and collaborative innovation

Shorter innovation cycles now exist in industry, creating new opportunities. Cisco and Optus established the National Industry Innovation Network to create a new model for collaborative research where the output is more likely to be a prototype than a white paper.

Collaborative innovation will be fuelled by new technology for remote collaboration, including VR and AR, which will make distant interactions more real and personal. 5G will further accelerate the possibilities of remote collaboration by researchers and industry partners to collaborate in real-time on high-bandwidth applications such as virtual labs.

61%

Creating industry experiences via digital platforms*

"We are part of the community, and we are for our communities – local, national, global. Leading research into real-world challenges, we are now needed to focus on outcomes to these challenges."

– Darren McKee, COO, Murdoch University

B. Incubation, acceleration and commercialisation as core services

Start-ups (or 'high-growth' firms) make up just 15% of all companies but contribute an estimated 50% of total jobs.[8] Young companies invest more in R&D than older ones and have become a much bigger target for universities in particular, but are also much more digitally demanding.

C. The campus as a living lab

Universities and TAFEs are microcosms of cities, with many operating their own transport services, buildings, lighting networks, energy grids, associated residential accommodation and support businesses and myriad other infrastructures. There is growing interest in using the physical campus as a 'living lab' to simultaneously create research opportunities and better campus services.

Administration and Operations

Digitised, efficient and automated

Cost pressures on institutions demand they find more efficiencies while maintaining high teaching, design, research and environmental sustainability standards. An institution's most precious asset – its reputation – needs to be protected at all costs, including from cyber security threats.

A. Automation

It's no longer sufficient to make data available to users; institutions need to automate decisions based on that data. Major opportunities exist in areas such dynamic timetabling (where spaces will be allocated based on actual usage), automated heating and cooling, automated lodging of faults / service demands and automated payments and infringement notices. Many of these applications rely on networks of low-cost IoT sensors that are intelligent and equipped with computing capabilities. When converged with AI and robotics they create potential for institutions to generate new data and services.

B. Improved space utilisation

Space is one of universities' largest fixed costs. In a constrained environment there is a pressure to do more with the same and optimise usage. The most inflexible spaces – lecture theatres – are being phased out, which creates opportunities for improved utilisation.

63%

Movement tracking / data analytics to improve space utilisation*

> "Understanding what people are doing on campus, including how buildings are used, will become more important as the use of spaces changes."
>
> – Ian Callahan, COO, Curtin University

C. Driving cost and complexity out of IT

Technology is not just about functionality; the IT function needs to also be more efficient recognising it's a major cost item on the balance sheet. Institutions are investing in a range of tools and platforms – including cloud – to drive cost and complexity out of IT. Given the efficiency imperative it's critical that institutions don't create unnecessary technology debt, and make technology decisions based on total cost of ownership and lifecycle costs, not just the up-front price.

D. Environmental sustainability and reduced emissions

Institutions have community obligations, including leadership in environmental sustainability. There is an expectation they will be ethical and smart users of energy and leaders in automated building control systems and smart waste.

66%

Automated building control systems to reduce energy consumption*

3. Funding and implementing change

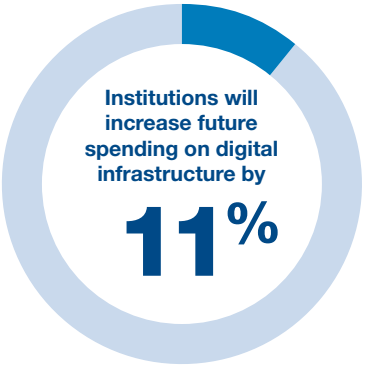
Digital will demand a greater share of university and TAFE investment

The return on investment is typically stronger from digital than traditional civil infrastructure. For example, at any economy level, increasing traditional infrastructure investments in building projects by 1% increases productivity by 0.23%[9] whereas investments in digital generate much better returns. For example, researchers estimate if the rest of the European Union built out its digital infrastructure to the level Norway achieved in 2011, GDP would increase by $315B[10] – representing approximately 2.4% of Europe's GDP.

At an institution level investment in digital helps to:

- Drive value from past investments and radically improve asset yield
- Overcome barriers of distance to ensure workers and customers can be connected
- Access international markets in a world of constrained mobility
- Take advantage of digital opportunities that drive productivity
- Automate processes and systems to be more competitive
- Be more resilient to cyber security threats.

Education leaders agree that investment in digital will become a bigger priority:

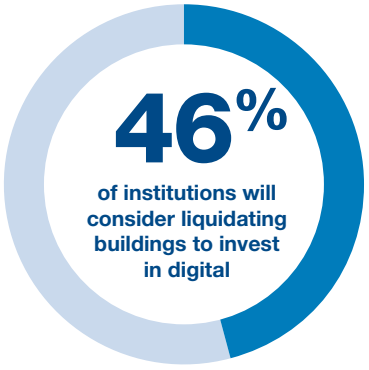


Drastic measures will be required to fund digital programs, including potential sale of assets

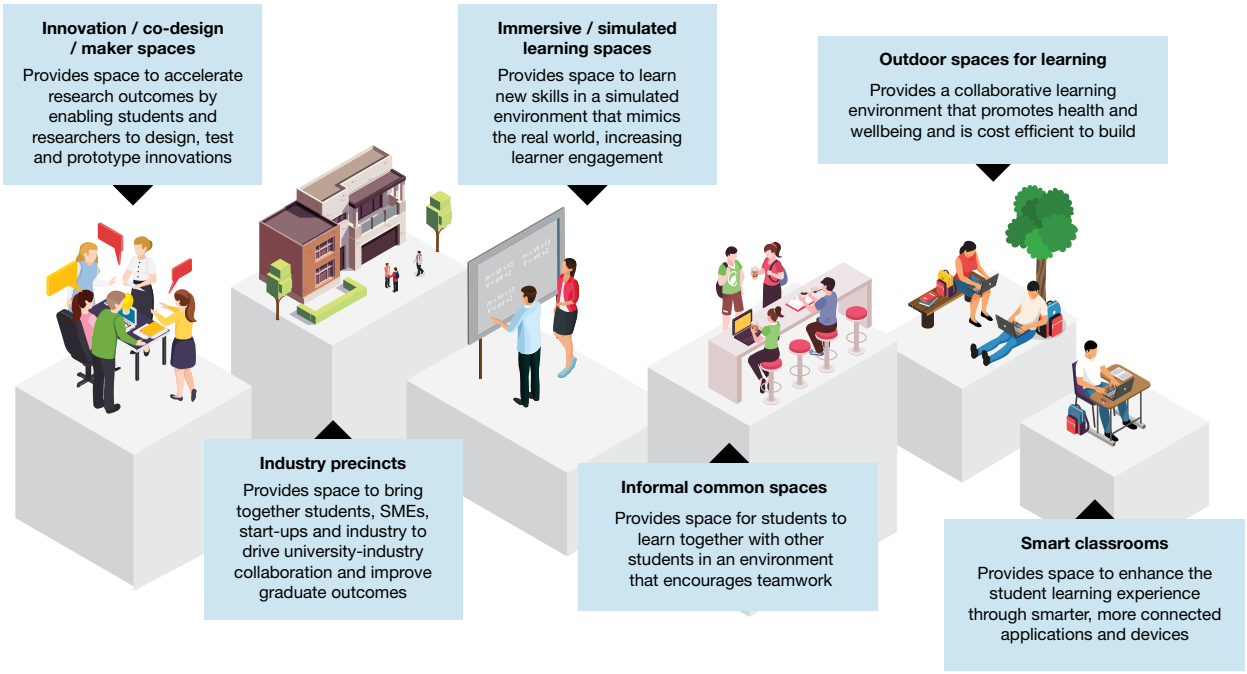
A major question for universities and TAFEs is where will funds come from to invest in the type of aggressive digitisation that is forecast. In addition to cost-saving strategies (such as rationalising courses, incentivising research productivity and better utilising existing space), expenditure will increasingly be redirected from capital works towards digital.

There are three major themes:

1. Planned capital works being put on hold and allocated funds being invested in digital. This is particularly true of student residences, lecture theatres and administration floorspace, which education leaders agree there will be less demand for in the future.
2. Some buildings will be liquidated with cost savings reinvested in digital to augment core spaces.
3. Institutions will change the way they finance technology and take advantage of vendor capital programs and as-a-service consumption models that smooth out expenditure.



A major challenge for institutions is forecast headwinds for the economy and property prices, which make this a challenging time to sell. Some institutions will mitigate this by repurposing facilities to meet demand for new spaces:



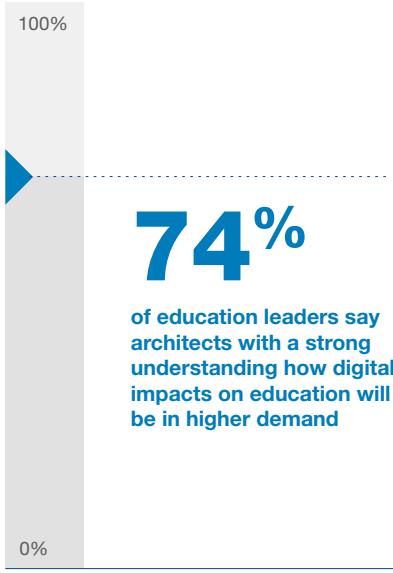
Digital will increasingly drive campus master planning

A question for education leaders is how will the different operating context impact on campus design, and the campus master planning process? In short, digital must now be baked into every aspect of the campus master planning process:

	1. Pre-planning & requirements gathering	2. Space analysis	3. Campus Master Plan design	4. Business case & detailed specs	5. Build and construct
What's typically involved	• Assessing trends and demographics • Setting expectations and aspirations • Developing a strategic plan	• Planning Framework Development • Strategy / Response Development • Process Design	• Planning Framework Development • Strategy / Response Development • Process Design	• Build and construct cost including quantity surveying • Determining costs	• Priority selection • Allocation of capital • Program implementation
What's new	**A** Architects will need to have a stronger understanding of digital when planning	**B** CIO has an elevated role in overseeing the campus master planning process	**C** Technology companies will play a larger role in design and implementation		

A. Architects will need to have a stronger understanding of digital when planning:

Planning frameworks and process design will need to consider how digital will be considered at each step of the master planning process.



74%

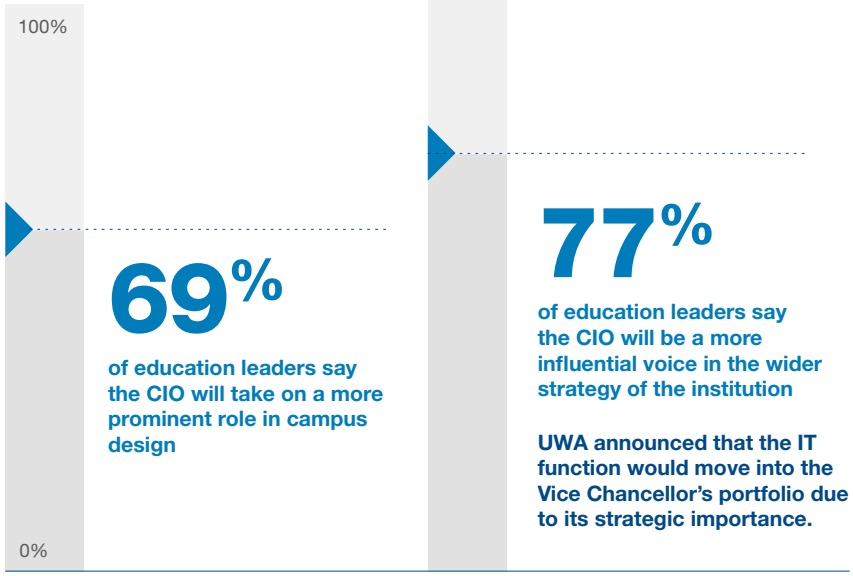
of education leaders say architects with a strong understanding how digital impacts on education will be in higher demand

"Campus master planning will change dramatically and digital infrastructure will increasingly have a much bigger voice compared to physical infrastructure."

– Paul Sherlock, CIO, University of South Australia

B. CIOs will have an elevated role in strategy and planning:

The CIO will be more integral to both the design of campuses and strategy of the institution.



69%

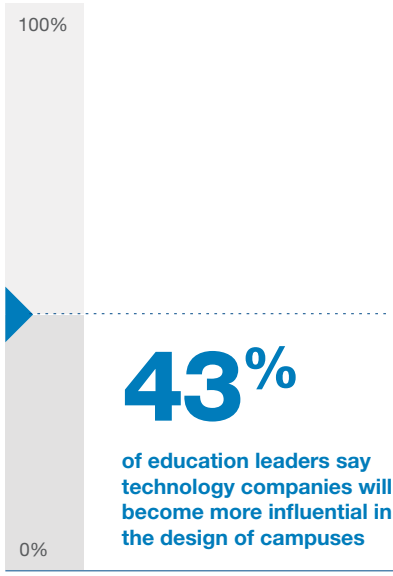
of education leaders say the CIO will take on a more prominent role in campus design

77%

of education leaders say the CIO will be a more influential voice in the wider strategy of the institution

UWA announced that the IT function would move into the Vice Chancellor's portfolio due to its strategic importance.

C. Technology companies will play a larger role in design and implementation



43%

of education leaders say technology companies will become more influential in the design of campuses

Technology companies need to be engaged earlier in the design process. This recognises that emerging technologies such as IoT and 5G present challenges for in-building coverage and that the right advice early in the process can avoid the cost and time taken to retrofit technology.

4. Recommendations for education leaders to operationalise forecast changes

Digitising campuses will not happen overnight. Education leaders need a framework to plan and operationalise for the new normal over the long-term and COVID-19 has helped to bring that framework into sharper focus. That framework starts with the response phase but is not necessarily linear given the potential for waves of impact. There are actions education leaders can take at each stage.

Respond
Immediate must do's

Reflect
Plan for next 3 – 18 months

Reimagine
Plan for a new normal

Rebound
Accelerate strategies now to win in the rebound

Respond Immediate must do's

1. Get underlaying platform in place: robust, scalable and secure

Sustained innovation and future competitiveness are increasingly dependent on a digital platform. That platform is increasingly software-defined, cloud-based, automated, scalable and secure.

The importance of underlaying 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. The education sector is particularly at risk. Legacy applications and infrastructure are a major vulnerability and put the education sector at significant risk from a cyber security threat perspective.

The growth in Internet of Things (IoT) is also creating additional pressures. The number of IoT-connected devices is projected to triple to 43 billion by 2023.[11] Protecting personal student data, employee records, commercial in confidence data and research IP is increasingly difficult and as a consequence almost two-thirds of organisations increased their spending on cyber security between 2018 and 2019 by an average of 30%. In some cases it was up to 200%[12]. Practical measures institutions can take include:

- Continually manage a portfolio of digital proof of concepts to test what's possible and fail fast
- Undertake an audit of cyber risks and potential vulnerabilities

Reflect Plan for the next 3 – 18 months

2. Adopt a digital first approach to strategy and implementation

Digital is now driving some of the most important decisions in higher and vocational education; it's no longer just an augmentation tool. Institutions need to move from having a separate digital strategy to embedding digital in their overarching organisational strategy. Institutions must ensure that all infrastructure is digitised, whether it's a new building, precinct, student housing development or other major civil works project. This creates the data platform that paves the way for infrastructure optimisation and, most importantly, automation that will drive short, medium and long-term cost efficiencies.

Practical measures institutions can take include:

- Hold a mirror up to existing strategic plans and ask whether it adequately reflects what's possible and what's probable in the digital economy
- Insist uptake of digital technologies, particularly in teaching and learning, is not optional

"People understand digital is here to stay and can be applied to all disciplines." – Jill Downie, Deputy-Vice Chancellor (Education), Curtin University

3. Prioritise digital expenditure over bricks and mortar

Global consumption of data has been growing at 24% CAGR since 2016[13] and spiked by up to 80% with the rapid shift to remote working and learning. This spike was largely driven by video.[14] The importance of cloud-based infrastructure has also been amplified by the remote nature of work and learning. Cloud technologies are impacting all aspects of university and TAFE operations – from providing researchers with cloud-based access to the tools they need to access and store data to the myriad teaching and administrative applications. Investments in digital deliver a better return on investment than traditional infrastructure and generally a) impact more students, b) accelerate the move towards blended learning / working, and c) create sustainable efficiencies.

In a rapidly evolving and more complex world, digital technology can also act as the "lubricant" to break-down the friction between different silos and support more agile, inter-disciplinary teaching and learning responses to the complexities of the new world.

Practical measures institutions can take include:

- Prioritise opportunities for digital to transform student experiences
- Undertake an audit of existing infrastructure assets and capacity to digitise

" Universities must reckon with the fact that the prevailing business model has been challenged, and focusing only on physical campuses to the detriment of effective digital approaches is unsustainable."

– Brad Birt, Director, Learning Partnerships, Curtin University

Reimagine Plan for the next normal

4. Broaden the ecosystem with input into campus master planning

Campus master planning is more important than ever. Given shortened innovation cycles and economic uncertainty, a premium will be placed on plans that have built-in flexibility and dynamism. Input into the campus master plans need to be broader with much better presentation from technology companies, local industry and the Chief Information Officer to ensure the transformative potential of digital is reflected in master plans.

Practical measures institutions can take include:

- Utilise innovation centres at universities to catalyse the master plan process, taking advantage of agile and collaborative methodologies and their industry networks
- While architecture and engineering perspectives are critical, technology companies need to be added to the master planning mix to provide visibility into digital futures and macro trends

Rebound Accelerate strategies now to win in the rebound

5. Extract more value out of industry partnerships

Partnerships are more critical and universities 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. This has happened to a degree in the TAFE sector; for example, 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. Opportunities to leverage partnerships to inform campus design, student experience and contemporary learning are boundless.

Practical measures institutions can take include:

- Understand the full value of partnerships and where partners can add value in non-obvious areas
- Invest in new mechanisms for collaboration, underpinned by creative value sharing models

" For guidance on how to scale, universities need look no further than big technology brands. Tech brands actively look for markets to expand into. They have the 'stretch', the funds, the credibility and the open-mindedness to reinvent themselves. Better yet, instead of borrowing from the strategy of tech brands, why not partner with them? By aligning with these organisations, universities can leverage their brand power with the lasting benefit to both being the ability to charge the brightest students as they train for a job." – Dan Bradley, Director, AlphaLab

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