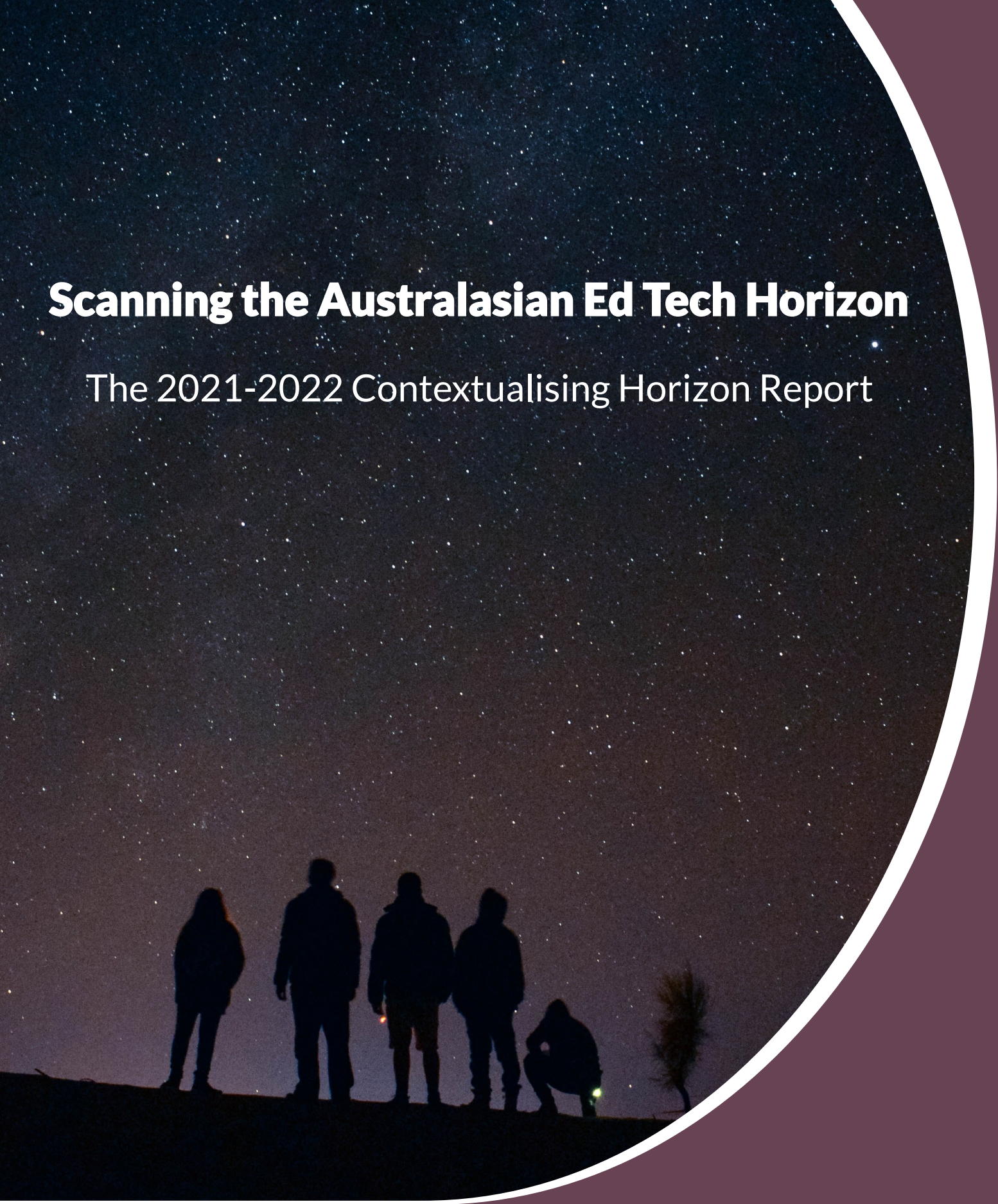

Scanning the Australasian Ed Tech Horizon

The 2021-2022 Contextualising Horizon Report

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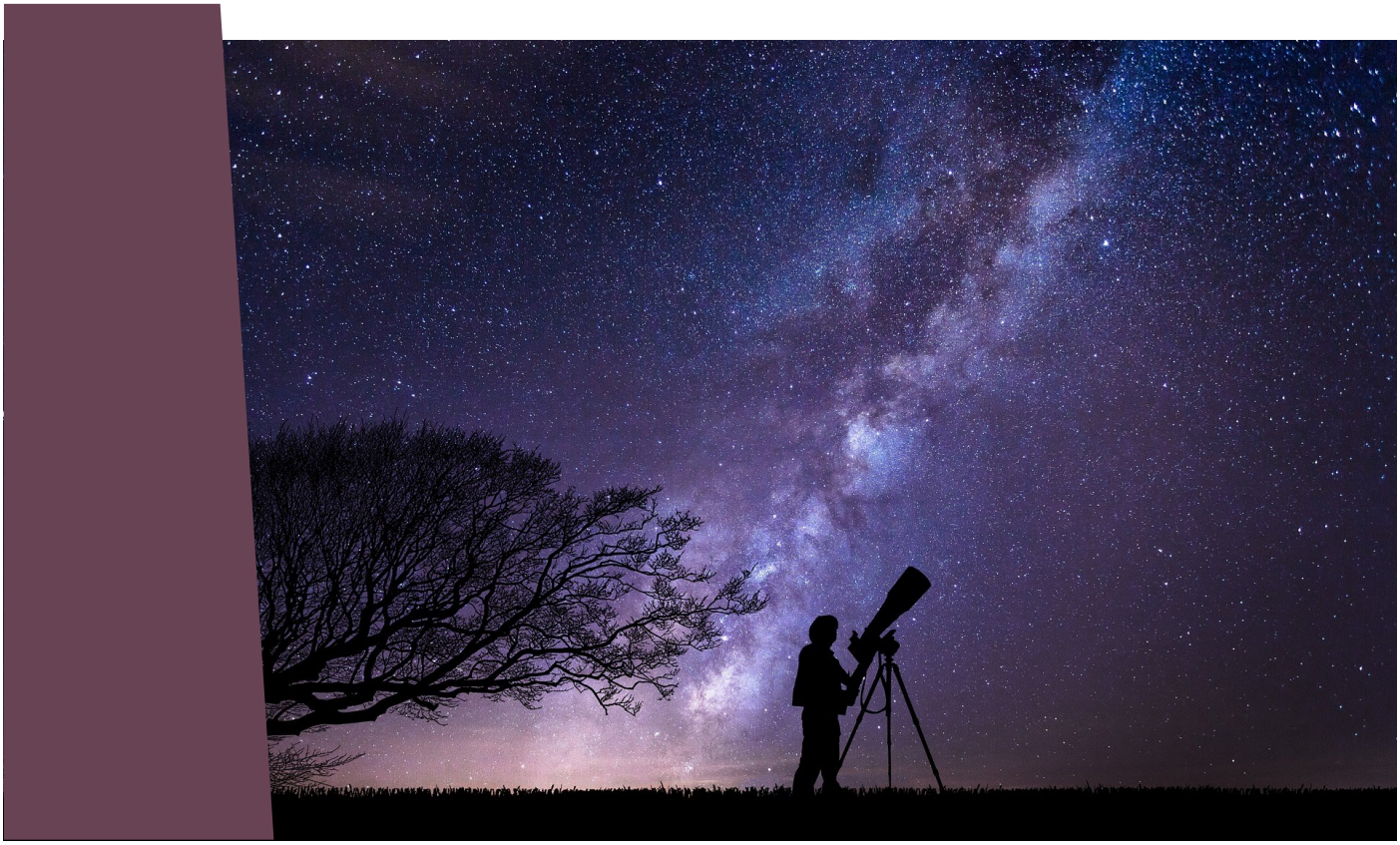
Executive Summary

In this first edition of *Contextualising Horizon*, the members of the ASCILITE community and affiliates explored the Social, Technological, Economic, Environmental, and Political trends impacting Australasian higher education. Underscoring the 2021–2022 report are the impacts of long-standing trends in Australasian higher education, including the political and economic standing of institutions, which are operating under resource constraints and expectations to do more with less. Furthermore, the shockwaves of the COVID-19 pandemic continue to be felt across the region. The pandemic response and rapid digitalisation have exposed sectoral vulnerabilities, such as dependence on international learners, mental health and wellbeing and digital equity. Likewise, they open opportunities for institutions to better support learners and staff, to increase access and inclusion and to redefine the sector in a way that caters to a more diverse population of learners and a service model that addresses lifelong learning.

Given the outcomes of the 2021–2022 scan of the horizon, it is not surprising that this year's technology and practice trends highlight and explore the possibilities of what institutions might look like going forward into the future. This year's technology and practice trends call into question long-standing practices in higher education. For example, **Redefining and interrogating pedagogical practices** explores such issues as the redefinition of the lecture and the design of assessment. Likewise, **Blended learning models**, **Co-design of higher education**, **Educational technology infrastructure to support learning**, and **Microcredentials** explore ways that we can better redesign higher education to support a wider array of learners and rethink the university experience. Lastly, this year's trends invite institutions to further probe the ways in which they support staff and learners. The pandemic laid bare extant inequities and vulnerabilities in the higher education sector. Thus, **Staff and learner self-care and wellbeing** and **Accessible content and digital equity** continue to be areas on which the sector must focus.

In this report, we explore both the dimensions of the environmental scan and this year's technologies and practices in depth. The report is not an exploration of these issues in their totality. However, it is meant to provide an introduction and jumping-off point to inform institutional discussions and strategic planning.



About ASCILITE

The Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) is the pre-eminent organisation for technology-enhanced learning research and practice in the Australasian region. With more than 1700 members, ASCILITE contributes to the international progression of educational technologies and practices to enhance learning and teaching. ASCILITE is pleased to sponsor Contextualising Horizon and to support the aims of benchmarking and identifying those technologies and practices of strategic importance today and into the future. To find out more about ASCILITE, visit ascilite.org.

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STEEP trends

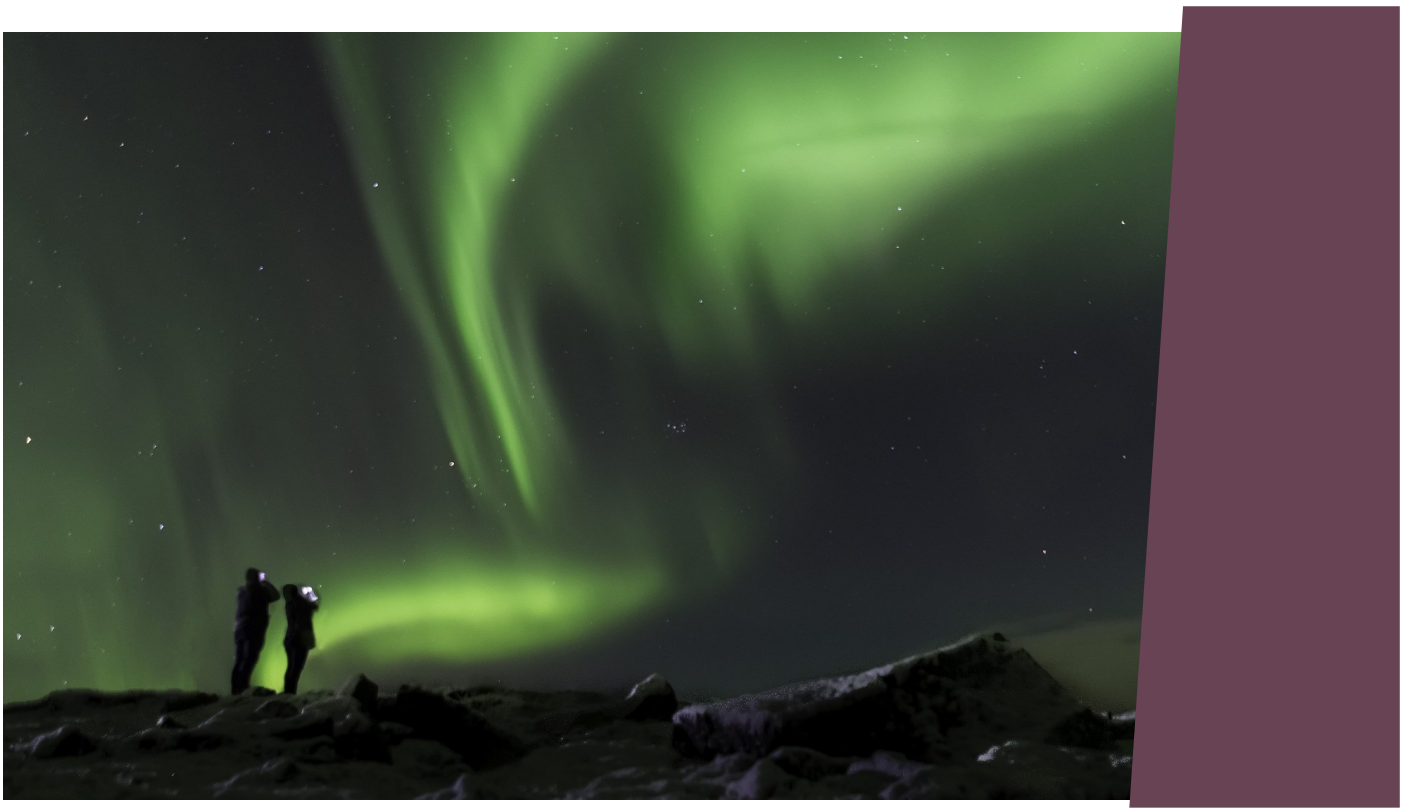
The Contextualising Horizon participants identified the Social, Technological, Economic, Environmental and Political (STEEP) trends likely to have a significant impact on Australasian higher education in the next 12–18 months. The COVID-19 pandemic featured heavily in this year's scanning of the horizon. The pandemic brought regional outbreaks, rolling lockdowns, varied access to vaccines, significant mortality rates and economic loss. Learners at all levels of education experienced frequent disruptions to studies and, in many instances, learning loss. As societies worked to control the virus, we witnessed long-standing educational disparities move from nearly invisible to explicit as learners with carer responsibilities, economic disadvantages and lack of access to hardware and reliable connectivity struggled to keep pace as learning moved online.

Universities reported severe impacts as a result of the pandemic. Financially, the restriction of learner movement because of international border closures condemned institutions to strict budget tightening and job rationalisation. The loss of this valuable stream of income put many institutions in precarious financial positions leading to widespread job insecurity. Teaching and learning rapidly digitalised, and staff, so used to face-to-face delivery, needed to upskill in the use of learning technologies.

For those staff members who survived the mass exodus from the sector through forced and voluntary redundancies and early retirement packages, the challenge was then to manage increased and demanding additional workloads. The austerity measures decimated professional staff and professoriate at many institutions, resulting in a significant loss of organisational and discipline knowledge.

The pandemic has resulted in a shift in the expectations around learning and teaching processes. Digital technologies have taken a role of increased necessity and importance for institutions to steel themselves against ongoing pandemic-related disruptions and emergent threats, including natural disasters and climate change. Furthermore, both learners and workers want the flexibility that technology affords. As these technologies and practices take on newfound importance, so does the ability to build capabilities of institutions, staff and learners to be digitally literate and to effectively use the technologies.

The 2021–2022 STEEP trends are the result of the lived experience of the pandemic in Australasian higher education.



Social

The pandemic has placed universities in precarious financial situations and, simultaneously, has accelerated the proliferation of blended and online approaches to teaching and learning. While many institutions already offered courses in online and blended formats, there has been a significant increase in such offerings. However, the rapid transition to remote learning has also given rise to concerns about learner isolation, mental health and wellbeing. Staff, too, are increasingly worried about the precarious nature of their employment as universities continue to take a highly conservative financial line. Meanwhile, as universities seek to address financial pressures and enhance the learner experience, microcredentials and short courses offer the promise of a means to address an increasingly diverse learner population, enabling learners to address time constraints and participate flexibly at an affordable cost. However, such approaches need to be mindful of the challenges around access and capability of both educators and learners.

Trend 1: Further diversification of learner population and digital divide

The diversification of the Australasian learner population means that learners possess inconsistent levels of both digital access and competence. This impact is particularly pronounced among learners from lower socio-economic areas and certain cohorts of international learners. The pandemic has raised expectations around access and online learning capabilities. Both learners and educators have been required to adapt to these expectations. However, as is expected, some individuals have been affected more than others. The impact of which has been the potential of learning inequities and learning loss.

Online learning requires both the hardware and the connectivity to participate fully and effectively in learning opportunities. However, connectivity issues (e.g., bandwidth, Wi-Fi capacity and screen size) impact the ability to engage in learning requirements, such as e-assessment. Furthermore, increasing bring-your-own-device expectations may be cost-prohibitive for learners, thus increasing access issues as well as introducing potential cybersecurity concerns for institutions.

When it comes to competency, access issues potentially result in divergent skills, which means that different learners start with different capabilities, which potentially places them at a significant disadvantage. Changes in political contexts for international learners (e.g., China, Ukraine), and associated changes in learner mobility, have the potential to continuously shift the levels of the tertiary education playing field, potentially increasing the need for online offerings that rely on certain levels of digital literacy. Different forms of engagement in online learning environments also have potential impacts on cultural diversity and Indigenous participation and engagement, although not necessarily negative. For educators, different levels of digital capabilities are an issue as well, requiring continuous professional development around pedagogy and training in different technologies. The need for lifelong learning capability becomes much more pronounced in online and technology-supported environments.

Evidence of issues around digital literacy in higher education, which have emerged because of the pandemic, are beginning to appear in the literature (Carolan et al., 2020; Romero-Hall & Jaramillo Cherrez, 2022). Of course, these issues are not new (Coldwell-Neilson, 2018; Press et al., 2019); however, the need to address them has just gained a lot more urgency. Devlin and Samarawickrema (2022) have most recently summed up the issues facing higher education as a result of the pandemic:

> *widening participation and increased student diversity; increasing accountability; the growth of transnational education; digital transformation; the rise of data analytics; evolving assessment philosophy and practice; work-integrated learning; the students as partners movement; the trend away from solo teaching; and new pedagogies for an unknown future. (p. 21)*

While some of these directly relate to the diversification of the learner population and the digital divide, others (e.g., new pedagogies for an unknown future) are more related to long-term responses that are only just beginning to be developed.

The digital divide and digital access were topics on the research agenda in Australia before the pandemic (Afshar et al., 2020; Willems et al., 2019), but this has achieved new urgency in the last couple of years. For example, a recent study by Drane et al. (2020) explored the impact of "learning at home".

Trend 2: Microcredentials

The growing interest in microcredentialisation in Australasian higher education is part of a broader trend towards more flexible approaches to accreditation and training. This has, in part, been stimulated by the demands of changing learner demographics and the demand for more flexible learning opportunities. Industry is also demanding more bespoke offerings that better cater to their requirements. In addition, microcredentials are often linked to ideas such as digital badging, short forms of learning, microlearning and enterprise learning.

Currently, policymakers and universities across Australasia continue to experiment with a variety of ways microcredentials might be implemented in their context. For example, Australia released its National Microcredentials Framework in 2022 (Australian Department of Education, Skills and Employment, 2021). This framework attempts to clearly define microcredentials and how this form of learning might be integrated with extant offerings. Universities also have started experimenting with stand-alone microcredentials, integrated microcredentials (i.e., microcredentials within an award course) and business-to-business or bespoke offerings (designed with a specific industry partner in mind). However, we anticipate a wider variety of offerings will be made available as well as further consideration given to how microcredentials fit within a hierarchy that includes free or open offerings, such as short forms of learning, and professional development opportunities.

As clarity about microcredentials emerges, we also expect that more developed partnerships between industry and universities will occur. For example, Google has recently partnered with Coursera to offer professional certifications (Coursera, 2022). This is likely to happen both on a large scale (i.e., in a specific industry) and between specific industry partners (e.g., a school and a faculty of education). It is further anticipated that there will be more focus on the transfer and acceptance of microcredentials amongst various bodies, including industry and private partners and higher education institutions. This creates significant challenges. Universities will need to ensure the quality and integrity of the microcredentials they choose to recognise. University microcredentials might also include the development of "stacked" courses, where various microcredentials can be combined to contribute towards a degree.

In the longer term, we may see the emergence of an alternative market that competes with higher education. For example, the Australian government expressed a particular interest in developing a marketplace for microcredentials (Chanthadavong, 2020). Vendors in this marketplace would include both universities and third-party providers. This has been described as a possible existential threat to the higher education sector (Braue, 2022). These vendors may elect to work directly with industry, bypassing the higher education sector. Third-party providers are already active in this space, in a variety of different ways. Some providers, such as Adobe and Linkedin Learning, offer courses for educators. Often, these courses are linked with an organisation that "certifies" the course and provides a mechanism for learners to share their achievement (e.g., using a badging company such as Credly). LinkedIn Learning offers courses in a variety of areas (often with either certification or university-level credit) and integrates these with the learner's LinkedIn portfolio. This suggests a shift in industry acceptance from the 3- to 4-year university degree, towards more targeted, job-ready training. To challenge this potential threat, the higher education sector needs to develop a strong voice that can promote the benefits of high-quality tertiary education.

Trend 3: Mental health and wellbeing

Higher education institutions have long placed secondary importance on learner and staff mental health and wellbeing, thus avoiding highlighting these issues to the wider public. However, the pandemic has raised public awareness of mental health, forcing higher education institutions to acknowledge and try to improve the mental health and wellbeing conditions for both learners and staff. As borders closed, learners studying outside their home countries were forced to make the decision to return home or stay in their host countries, losing valuable study time and sacrificing stable work and living conditions. Domestic learners bore the impact of having no work, being isolated and juggling the demands of life and study, often causing them to halt or postpone their pursuit of desired qualifications or jobs. Lockdowns ensued, with the situation worsening; with lockdowns at an end, we had additional volatility introduced by the global political and socio-economic climate; for example, the war in Ukraine and the economic power struggles with China as well as the associated impacts on cost of living, such as rising food costs and petrol prices. These additional stressors forced learners to weigh up work against their studies.

Staff have similarly faced the impacts of the pandemic and the current geopolitical volatility. In response to the economic impacts of the pandemic, institutions scaled back staff numbers in both 2020 and 2021. Furthermore, staff are experiencing burnout as institutions navigate the volatility of the current climate as well as long-term pandemic-related illnesses. While many universities ensured staff knew that they were able to use employer-provided counselling services, this did not alleviate actual workload and pressures from working at home. Staff burnout continues to affect universities, and in 2022, staff illness is another driver affecting health and wellbeing.

It has been acknowledged globally that workplaces and education institutions need to put policies and guidelines in place to ensure that they are prioritising the mental health and wellbeing of both learners and staff. For example, the Australian Mental Health and Wellbeing framework, developed in 2020, has articulated the principles which should "underpin a clear commitment by universities and mental health services to prioritise learners' mental health and wellbeing" (Orygen, 2020, p. 3). It is evident there is a call for work to begin in recognising the importance of creating a relationship between mental wellbeing and educational success. This signals the call for members of the university community to contribute to learning environments that enhance learners' mental health and wellbeing, which should foster a diverse, inclusive and connected environment to support academic and personal achievements. With learning design given much needed attention with regards to the development of sound teaching and learning practices in higher education since the start of the pandemic, terms such as "pedagogy of kindness" (Daniel, 2019) and "pedagogy of care" (Mehrotra, 2021) have also been brought to the fore when looking at developing teaching and learning practices and materials that cater to mental health and wellbeing needs of learners. The push for inclusivity and accessibility in teaching and learning practices has also been a rising trend among the universities across Australasia. There is a similar call for mental health and wellbeing frameworks for teaching and professional staff working in higher education.

Technological

Australasian higher education fluctuates between technology driving change and higher education practitioners leveraging technology to innovate and improve practice. The move to emergency remote teaching in response to the pandemic has accelerated both the adoption of new technologies and the pace of innovation. Since the implementation of emergency remote teaching, the sector has had an opportunity to reflect on changes to practice and to adopt a more considered approach to online learning. The sector is now positioned to address concerns about learner and digital equity, technology usage and potentially exclusionary practices. Addressing inequities and effective technology integration require effective staff development and reflective practice.

Trend 1: Learner digital equity

Multiple learner and digital equity-related issues have been identified as a result of the pandemic. This includes issues of digital equity that directly affect First Nations learners (Bennett et al., 2020) and diverse migrant and/or refugee learners (Mupenzi, 2020); cyberbullying (O'Connor et al., 2018); the widespread use (and learner perceptions) of synchronous conferencing technologies such as Zoom (Serhan, 2020), including implications of Zoom fatigue (Massner, 2021); the implications of going online for assessment, in particular the use and policies around proctoring software (Dawson, 2020); and concerns around cybersecurity (Abassi et al., 2022). Most of these issues are not new, but they have gained considerable urgency in the short term, as a result of the rapid move online in response to the pandemic. The immediate impact has been that higher education institutions were forced to respond rapidly, in some cases leading to knee-jerk responses (Connolly & Hall, 2021), which institutions are now reflecting on for the longer term (Bartolic et al., 2021; Ewing, 2021). One of the most obvious short-term impacts of the pandemic has been the reduction in international learner numbers. As Leask and Ziguras (2020) have noted, "for institutions, the economic cost was estimated to be in excess of A$3 billion" (p. 36). They further noted that Australia is vulnerable to global shocks, with international learners comprising over a quarter of its learner population, yet "universities have transitioned to online operations quite seamlessly, which might bring lasting cultural change to their operations" (Leask & Ziguras, 2020, p. 36).

In addition, however, there are some key trends in Australasia that may have impacts that significantly relate to learner and digital equity. These include increasing bring-your-own-device expectations (Kaliisa et al., 2019), increasing impact of artificial intelligence (AI) (Zawacki-Richter et al., 2019) and the increasing importance of digital literacy development (Press et al., 2019).

Trend 2: Online learning and faculty development

The pivot to remote learning was fast, furious and evidence of the sector's agility and ingenuity. Higher education went from dipping its toe into online learning to a deep dive. The sector reached a turning point, and there is no going back. Blended, hybrid, online learning modes are here to stay. Pandemic pedagogy served its purpose; however, a new normal is transforming online learning with a nuanced digital pedagogy that incorporates a rich learning experience through social, cognitive and teacher presence (Cronin, 2022) and enhanced connectiveness and inclusiveness.

As academics step further into a space where learners may possess superior digital knowledge and skills, managing learners' expectations for flexibility and ways of engaging adds another layer to the everchanging faculty role. Back channels and chat facilities now supplement or even replace traditional class discussions. There is an expectation for academic teachers to be a digital learning technologist who works seamlessly across many different digital tools. Where once these skills were desirable, digital fluency is now essential. The academic teachers of the future will be resilient, transformative and agile individuals who are digitally fluent and move with ease across multiple digital learning platforms. Furthermore, a rise in learner agency will see learners and academics working together to navigate the hybrid/online classroom.

The changing face of online assessments will continue after the pandemic. Universities pivoted to online exams during the pandemic, and many have not returned. Both proctored and non-proctored online exams will replace invigilated face-to-face exams as the standard. Academics will also prioritise and design authentic assessments in the race to keep ahead of academic misconduct concerns. Privacy issues, data breaches, exam authorship authentication and academic integrity concerns will drive further development in authentic assessment design. Cooperation between regulatory and accreditation bodies, proctoring services, learner advocates and the higher education sector will be required to meet these challenges (Selwyn et al., 2021).

The impact of the changing nature of work on faculty wellbeing is evident with work-related stress reported across the sector (McGaughey et al., 2021). Faculty often deliver face-to-face teaching while managing live streams and keeping abreast of the learner back channel (chat facility). Suffering from digital fatigue and fears of poor digital competence, faculty are struggling to keep up with the rapid fundamental changes to their work, pedagogies and place within higher education (McGaughey et al., 2021). Supporting and developing faculty skills have gained precedence.

Further casualisation of the workforce places institutions at additional risk (Littleton & Stanford, 2021) if a highly skilled digital workforce is not maintained. Institutions need to develop novel ways to upskill the academic staff in digital pedagogies and teaching and assessing. Educationall and instructional designers are a fast-growing role in higher education with a 13% projected job growth compared with 0% growth in academic roles (Seek, 2022). Educational designers working cooperatively and collaboratively with faculty would assist in building digital capacity to meet new workforce needs (McInnes et al., 2020).

Heavy investment in faculty development is essential to deliver quality online learning and authentic assessment activities. Capacity building through collaborative development processes, at-elbow support, online professional development and communities of practice (McInnes et al., 2020), with the priority on digital adoption and implementation for time poor academics, is no longer a nice-to-have but a must-have.

Trend 3: Widespread uptake of digital technologies

The pandemic-driven widespread uptake of digital technologies shows no sign of slowing, and this will have implications for access to learning, the learning experience and the health and wellbeing of learners. The increasing rates of online asynchronous learning opportunities and the growing distribution of learning materials via online learning management systems (LMSs) are creating greater demands for learners to maintain personal access to technology. Inclusive design of learning, specifically for online environments and for access via mobile learning devices such as phones and tablets, are providing new opportunities for access to a wider range of learners. Implementing hybrid and hyflex teaching modes is improving access, allowing greater learner autonomy and flexibility in access to learning opportunities. However, these teaching approaches require changes to pedagogical design to ensure interaction and engagement for all learners.

The mediation and facilitation of learning through digital technologies is providing new avenues to improve learning outcomes. The capacity to gather and analyse data generated through digitally mediated communications is being leveraged through improved application of data analytics to drive innovative pedagogical developments. Increased acknowledgement of digital badging is also creating enhanced motivation and more accurate evidence of learning.

Greater reliance upon digitally mediated learning experiences is leading to new ways of understanding the concepts of time and space, as learners choose when and where they engage in their learning. This has implications for the health and wellbeing of stakeholders throughout the university, particularly those directly involved with learning and teaching. Promoting success for learners engaging in virtual opportunities requires intentional pedagogical design and creative use of technologies to ensure online contexts do not lead to disconnection and isolation. Interactive and collaborative online workspaces, synchronous multimedia and communication via a range of digital channels allow learners to experience teacher presence, thereby enhancing wellbeing and improving the learning experience.

Economic

Governments and universities are addressing the pandemic's economic impacts, including an insecure job market, increased costs of living and declining economic growth. These factors are both reflected in and shape higher education.

Trend 1: Jobs: Insecurity, casualisation and staff retention

The pandemic has contributed to academic job losses, insecurity and casualisation. For example, the Australian higher education sector experienced a recession larger than any other non-agricultural industry in the Australian economy. Australia closed its borders, creating financial and operational issues for Australian universities. Pre-pandemic, employment in tertiary education grew by about 10% per year on average from 2015 through 2020. However, during the 12 months to May 2021, total tertiary education employment fell by almost 40,000 positions, over 90% of which were full-time (Littleton & Stanford, 2021).

Casual workers suffered the greatest proportion of job losses, particularly during the initial lockdowns. Increasing reliance on a casualised workforce has been a key strategy for reducing operational costs in Australasian universities, whilst addressing the downward trends in learner enrolments at universities, particularly international learners. A recent study into the scope of casualisation in New Zealand found it difficult to quantify but suggested that 40% of those teaching in higher education were casual staff (Oldfield et al., 2021). In many countries, casual or contingent academic teaching staff are the fastest growing population in higher education, with continued increases anticipated. Casual employees have no ongoing entitlement to work and minimal recourse when contracts finish and are not renewed. Change has created academic workplaces which are populated largely by career casuals who are highly educated and skilled and replace academics who once held tenured positions. Insecure tenure has been found as a major stressor for Australasian academics (Lee et al., 2022). A survey of 151 early career academics and researchers in Australia found that academics in a position of minimal job security, resulted in increased stress, burnout, disengagement, lack of satisfaction in the work environment and adverse mental health in this cohort (Lee et al., 2022). The pandemic is thus reinforcing the trend of casualisation in universities resulting in a precariat academic population who cycle among unemployment, underemployment and overwork; are underpaid; and cling to tenuous contracts in hopes of achieving a full-time position.

A recent study into the scope of casualisation in New Zealand found it difficult to quantify but suggested that 40% of staff remaining in the sector experience stress as workloads increase, and institutions struggle to recruit and retain staff. Staff who successfully keep their positions may experience survivor guilt, including shame, unworthiness and anger. Improperly processed emotions impact staff's sense of physical and mental health and can lead to depression, anxiety and physical illness.

Trend 2: Financial insecurity

The pandemic has impacted employment globally, and that includes learners' employment. For learners who make a living from part-time income whilst studying, the loss of employment has meant weighing concerns of financial insecurity, living expenses and university fees against persistence in their studies. Furthermore, the cost of living is increasing, and governments are providing minimal support, particularly for international learners. Japan's Labour Force Survey conducted in March 2020 identified the effects of the pandemic on the employment status and lives of working learners. Learners described difficulty continuing their studies and balancing their research activities due to financial hardships (Tsurugano et al., 2021).

Given the rising cost of living, learners who have been able to achieve or maintain paid employment are having to work more hours to achieve the same ends. It has been demonstrated that a negative relationship exists between the numbers of hours worked each week and learners' grade point average. This includes learners working as little as 16 hours per week who demonstrate higher attrition, disengagement and academic underachievement (Christiansen et al., 2019).

Trend 3: Resource-intensive priorities

The pandemic and demands from industry are transforming the ways in which universities assess learning. Lockdowns, distancing requirements and globally distributed learners have made traditional exams almost impossible. Furthermore, even before the pandemic, industry impressed upon institutions the need to prepare learners for the workforce. Effectively implementing these solutions requires an immense amount of university resources in terms of time, money and people.

With the rapid shift to remote learning, institutions had to look for alternative methods to replace their traditional examinations. In many cases, they quickly implemented a range of online proctoring tools and third-party vendors to invigilate exams. The costs of implementation can vary depending on the type of assessment and whether invigilation employs human proctors or uses AI. Media reports have indicated that the cost of online proctored exams is around $10 to $20 per exam sitting for AI invigilation and $15 to $35 for human invigilation per learner (Dawson, 2021).

Proctored exams raise other concerns, including academic workload, academic integrity and learner experience. Learners have reported that online invigilated exams feel like they are under surveillance, and their experience was poor (Dawson, 2021). Authentic assessment is an alternative assessment type that is both viable and future focused. For example, one alternative that has been explored is the use of interactive orals, which address scalability in terms of learner numbers and address massification of the higher education sector, while maintaining academic integrity and ease of management and design for academics (Sotiriadou et al., 2020).

Employability is also significantly transforming the higher education sector. Government and industry encourage tertiary institutions to increase learners' access to practical and authentic learning experiences. Universities, therefore, have begun to strategically focus on expanding the opportunities for learners to pursue meaningful work-based experiences. This focus, in combination with the pandemic, has provided a sudden and significant driver for rapid change and the adoption of innovative online work integrated learning (WIL) pedagogies and practices. In responding to these challenges and opportunities, WIL now extends beyond placement-based experiences and includes emerging practices, such as authentic learning experiences, hackathons, micro-placements, competitions and events. Technological platforms have enabled growth in online projects, virtual placements, online simulations and virtual reality WIL experiences. New models of WIL will need to address scalability of access and opportunity as they move from one-to-one to one-to-many, where one workplace supervisor mentors a group of learners, or many-to-many, where multiple staff guide and coach large learner cohorts (Dean & Campbell, 2020). It is imperative that the education sector understands the impact and long-term benefits of alternative and non-placement WIL models.

Environmental

The world's population continues to grow with increasing demands on planetary resources. Human innovations catering to the ever-increasing population's needs, particularly in technologies, have also rapidly risen. Simultaneously, the increased severity, duration and frequency of extreme weather events such as floods, bushfires and heatwaves are predicted. Rising seawater levels, loss of biodiversity and the greenhouse effect are also increasing. The scale and intensity of the climatic and ecological breakdown are threatening the wellbeing of all life on Earth. The world is not reaching the required speed of alleviating pressures on climate change and the conservation of natural resources for a sustainable future. Higher education institutions have a responsibility and a capacity to transform society towards sustainability and environmental protection. This can be achieved by addressing the mandate of 17 United Nations Sustainable Development Goals (SDGs) addressing diverse needs for human wellbeing whilst respecting Earth's resources and preserving them for future generations (United Nations, 2022). Increasingly, and justifiably so, we are seeing an acknowledgment, acceptance and incorporation of Indigenous Knowledge in environmental protection and support for Indigenous people's rights, ensuring culturally sensitive, inclusive and equitable existence for all. Climate change and sustainability are intricately linked and need to be considered as interdependent trends. Education must address both equally and empower learners to develop knowledge, skills and attributes supportive of developing, implementing and evaluating solutions respectful of using knowledge holistically inclusive of Indigenous Ways of Knowing and Being.

Trend 1: Sustainability

The SDGs are a global attempt to support all countries to address the population needs to achieve the required level of contribution and commitment to peace and prosperity (United Nations, 2022). Higher educational institutions are key transformational agents creating an impact on learners and the wider community towards changing habits supportive of actively addressing critical challenges. Quality education, the fourth SDG, emphasises that educational institutions have a major responsibility towards defining and delivering sustainability learning objectives. This includes pedagogical approaches to empower the learners with the graduate attributes, skills and competencies required to proactively implement sustainability principles to ensure equitable life on Earth. Furthermore, the investments in teaching and learning resources and infrastructure need to be sustainable, particularly when considering digital learning solutions, as absolutely necessary to achieve these goals. Higher education institutions must lead inter- and transdisciplinary education and research highlighting sustainability and environmental health. The concept of environmental sustainability encompasses closer partnerships between universities and industry partners leading to education programmes that create graduates who can step into the challenging roles and address their organisations' impact on the environment. Especially, increased focus is required on the environmental health and the individual impact on nature and how this translates to the preservation of ecosystems, regardless of geopolitical location or financial resources. Therefore, sustainability practices must be expanded to consider all aspects of sustainability identified in the context of the SDGs and approached through an organisation-wide strategy. Additionally, organisations should encourage and move towards forming partnerships with local, national and international levels to ensure global equity and climate justice.

Trend 2: Climate change

The existential threat to Earth's ecosystem and the SDGs associated with climate change require rapid development of high-level interdisciplinary and multi-sectorial collaborations to reduce carbon emissions society-wide to safeguard One Health. The concept of One Health unifies the health of the environment, plants and animals with human health, and the educational institutions can be proactive in this space. Therefore, the future focus must be on preparing learners to measure and document the source and progression of climate change and its consequences, implementing science of climate change mitigation

and adaptation solutions, innovating emissions reduction across all sectors, and exploring geoengineering possibilities.

In the context of Earth Sciences education, the emphasis is on developing environmentally sustainable mining for critical mineral resources (minerals needed to build wind turbines, solar panels, electric vehicles, batteries), whilst moving away from fossil fuel extraction and exploring possibilities for geoengineering that remove carbon dioxide from the atmosphere and oceans. Meanwhile, engineering is focused on the development of more efficient renewable energy production, improved battery technology, and enhanced recycling and reduction of waste. Bioscience is investigating how bacteria control atmospheric composition, microbial resistance to medications and prevention of infectious diseases, food security, global biodiversity, and helping the environment adapt to climate change challenges.

Concerning digital technology, the focus is on emission reductions associated with saved travel time, reduced infectious disease transmission risks and the redesign of technology to minimise carbon emissions and burdens on electricity consumption. Inventions involving AI and machine learning to configure digital technologies with lower emissions are also evolving. Preparing learners for the complex data analytics required to support adaptation and mitigation of climate change impacts on different sectors is also required but seems absent from many offerings. Green computing is increasingly integrated into the information technology curriculum, preparing learners for innovation in reducing information technology's energy consumption and carbon footprint. In addition to creating climate-resilient healthcare and industrial systems, there is an increased emphasis on mitigation and adaptation through community-based research and the integration of Indigenous ways of knowing to support interventions aimed at the community's ability to adapt to climate change. Addressing climate change challenges is dependent on the continuous emphasis on holistic, transdisciplinary, collaborative and community-centric approaches geared towards meeting the SDGs.

Trend 3: Indigenous environmental recognition

There is a growing trend within academia recognising the importance of Indigenous knowledges in their own right but also for the benefit of our environments. These trends reflect the increased recognition of the value of the knowledges of Indigenous peoples for maintaining specific environments and species over sustained periods of time. Aligned with this are the more widespread practices of cultural protocols agreements that focus on intellectual property (including Indigenous Cultural and Intellectual Property) for communities and/or traditional owners. Similarly, a firm understanding of benefit-sharing informing cultural heritage protection and management (UNDRIP) is desirable. Notably, within Australia, since 2019, there has been a surge in understanding cultural fire practices to counteract the devastation of bushfires. It must be noted that there is a wide range of Indigenous knowledge and perspectives that are yet to be incorporated within universities, especially when considering our environments. This is also represented in the methods of teaching and those who are teaching within higher education, for example, engaging community knowledge holders as educators. Across the Australasian region, the extent to which the incorporation of Indigenous knowledges in teaching and learning, and research is uneven. There are opportunities for strengthening collaborative partnerships with Indigenous communities which would enhance the understanding of Indigenous cultures and knowledges, their incorporation of knowledge systems and the representation of cultural knowledge within curricula.

Political

As the pandemic continues, governments across Australasia are striving to become future-ready through building resilience and readying communities for future disruptive events, using advanced data management tools for sharing data and enabling collaboration and offering equitable and inclusive programmes and services. Other factors influencing the political environment revolve around technological advancements, climate change and economic and geopolitical disruption. Governmental policies to reshape and future-proof the workforce require tertiary institutions to help to upskill and prepare workforce -ready graduates. However, higher education policies and decisions come through as budget announcements, rather than carefully constructed long-term plans and strategies. As governmental policies continue to shape higher education across Australasia, border restrictions and learner mobility, funding for higher education and data privacy are three trends likely to be important influences in the immediate future.

Trend 1: Border restrictions and learner mobility

The pandemic-induced travel and border restrictions have limited learner mobility across the Australasian region. Policies for international learners during the pandemic have created a “hierarchy” of international learner mobility ranging from learners being locked out, locked in, left out or in. This suggests that governments will need a plan for an equitable recovery for all learners. Prior to the pandemic, universities in Australasia enjoyed the increasing global demand for international education with limited recruitment and marketing. Among the key lessons from the pandemic is that international learners are more vital to universities than perhaps formerly thought and that internationalisation must be more intentional. Importantly, a unified voice is lacking, and learners are left confused, anxious and frustrated with different and changing rules, restrictions, exemptions, quarantine and testing arrangements, border policies and requirements. Due to variance on the political decisions and government directives, learner mobility in Australasia is changing landscape. Chinese learners’ mobility is declining, while Japanese and Chinese learner mobility is showing signs of recovery and is increasing.

As a result of border restrictions and the changing landscape of learner mobility, institutions have responded with remote study options. For institutions, this also has meant addressing issues of academic integrity and remote assessment and proctoring. It is critical to enhance learners’ awareness of their rights and responsibilities while living, working and studying in Australasia, and support the capability of all providers to deliver learner support programmes.

Trend 2: Funding for higher education

There is considerable diversity on government funding for higher education across most nations within Australasia that will persist. In line with global trends, many Australasian universities’ funding has been adversely affected in the last 2 years. Budget pressures forced universities to cease intakes for courses that will be underfunded or have low enrolment numbers, and to cut back in non-core areas, such as marketing, administration- and learner support. The potential underfunding of counselling and mental health services means that learners may not have access to adequate psychological support, while quality career advice could also be left wanting. Regional campuses and learners may feel these impacts the most. The trend of governments focusing on massifying higher education has traditionally resulted in bringing learners back rapidly, but as university numbers grow, spending per learner drops, raising concerns on quality assurance and learner learning.

Some universities have used the uncertain and unpredictable environment created by the pandemic to reshape their organisations to address financial stresses not directly linked with the pandemic, such as changes in learner fees and investment returns. Faculties and departments have been restructured, subject offerings reduced and other curriculum reforms implemented, leading to very significant staff reductions in some universities. The toll on casual staff (inexperienced, non-tenured academic staff and

non-academic staff) is indicative how they shouldered the lion's share of job losses. With many universities in Australia expected to report a strong financial recovery in 2022, this trend may be reversed.

Caution is also observed in funding research, as political shifts and changes in governments also impact funding allocations for research in tertiary education. The Australian university system is largely funded through government research and teaching grants, and learner fees are supported by a government-backed loan scheme. Furthermore, a recent minister reversal of a decision on peer-assessed grants signalled a threat to academic freedom and research futures (Barnes, 2022). In China, the governance structure of universities hinders the diversification of funding sources. In response, a new multi-channel financing system has emerged with the participation of multiple stakeholders. Higher education in India is subject to heavy government involvement. Also, many prominent political figures either own or sit on the managerial board of universities. This leads to the exertion of intense political pressures on the administration of these institutions. The inability of the state to fund the expanding higher education system has resulted in the rapid growth of private higher education. The private sector's primary modes of financing include donations, capitation fees and exorbitant fee rates. This in turn limits general accessibility to higher education, by catering to only an elite few.

Trend 3: Data privacy

Data protection laws have attracted the global spotlight. The critical importance of maintaining strong data privacy and governance policies and protocols has increased with the shift toward a remote delivery model in higher education. Stronger privacy protections have meant that institutions have a greater responsibility to disclose to learners how their data will be used and what data can be given to or solicited from learners. The need for sufficient transparency regarding data collection and learner privacy is imperative, particularly when learners are unclear or unaware of what data is collected (Shore, 2021). It has likewise forced institutions to respond to situations in which learners may have been subjected to sharing their data, such as the recording of class sessions and the use of remote proctoring for exams, access of learner data via learning platforms and the collection of health information, particularly pandemic -related symptoms and absences. As institutions moved to partial or full remote delivery, many Australasian institutions increased their governance policies and protocols around data. These are likely to remain in place as institutions return to pre-pandemic operations. Furthermore, as institutions return to campus operations, they will need to continue to invest in their privacy practices. Potential variance in the policies and practices of different universities on learner privacy and data requirements can lead to confusion and lack of transparency. To ensure that learner data privacy remains an institutional priority during and beyond the current pandemic, higher education leaders should confirm that standards, policies and guidelines are collaboratively developed by a diverse and representative group of stakeholders with broad expertise in learner privacy and data protection. This collaboration needs to occur within a well-defined governance structure, with clear roles and responsibilities and defined outcomes. To that end, over the last few years, colleges and universities have increasingly established the role of chief privacy officer and campus-wide privacy governance boards. Leadership from these individuals has never been more critical (Neale & Trynieck, 2020).

Technologies and practices

The 2021–2022 *Contextualising Horizon* technologies and practices exemplify a shift in mindset and consciousness emerging from the pandemic. The pandemic exacerbated and made apparent inequities and issues too easily ignored in the sector. Given the discussions around learner equity, the digital divide and mental health as well as issues around workload, it is therefore no surprise that these were identified as important areas for institutions to address. The practices and technologies address not only the future directions in which higher education may need to pivot to continue to continue to remain relevant to an increasingly diverse learning population but also the need for higher education to reflect on and question long-standing practices and conventions, such as the value of traditional lectures and exams. Furthermore, increasing political and economic pressures are forcing discussions around the purpose of higher education and its legitimacy in terms of cost-benefit and its value in terms of preparing learners for the workforce and the future of work.

For 2021–2022, *Contextualising Horizon* identified seven trends to be of strategic importance in the subsequent 12–18 months. They are:

1. Redefining and interrogating pedagogical practices
2. Self-care and wellbeing for staff and learners
3. Blended learning models
4. Educational technology infrastructure to enable learning
5. Accessible content and digital equity
6. Co-design of higher education
7. Microcredentials

Redefining and interrogating pedagogical practices

Lockdowns and the rapid pivot to remote teaching disrupted much of Australasian higher education and has given us impetus to rethink educational design and practice. Overnight, some educators found themselves thrown into remote teaching, while for others, their courses were already designed with blended and online learning in mind. Universities with large face-to-face cohorts have tended to rely upon traditional teaching and assessment modes, with some variation across faculties and departments. Long before the pandemic, learners had been choosing flexible, online teaching and learning modes with dedicated online providers with programmes purposefully designed to leverage online technologies over the traditional on-campus experiences. Many across the higher education sector have recognised this as an opportune time to reflect on just how far education has shifted from a teacher-centred to a learner-centred approach, and how technology may enable or hinder that process.

The persistence of lectures in higher education has been an important topic of conversation. Academics who resist didactic pedagogies have worked hard to make lectures and learning more active. Some academics see lectures as an opportunity to stimulate, motivate and challenge learners. Preparing and performing interactive lecture content at scale, however, may still be the exception rather than the norm. Many universities were unprepared for remote learning in the pandemic and resorted to transposing traditional stand-and-deliver lectures into online recordings. Personal interactions in large lecture-format teaching are more difficult than in small-group discussive settings. Developing high-quality interactive online material requires expert skills and intensive resourcing, which most universities have found difficult to achieve. During the rapid flip to remote learning, the critical role of specialist third space staff and technology has become apparent. This includes learning designers and professional development units who upskilled academic staff and educational technologists who supported toolsets that went from nice-to-have to mission-critical overnight.

To manage this sudden change, some institutions have turned to pre-built educational packages and have been exploring the use of AI and adaptive technologies. In Singapore, the National University of Singapore has integrated basic adaptive learning tools into their university's LMS (LuminNUS). The Singapore Management University partnered with commercial providers, such as Desire2Learn, to adopt integrated learning platforms that include joining AI analytics tools with the LMS. This approach means teachers spend less time customising teaching material for each subset of learners, given the adaptive features of the platform.

The pandemic has reminded us of not only our social nature but also the value of a better work-life balance. In lockdowns, a sense of community was often missing. Understandably, this has manifested

Active engagement with discipline knowledge

The Business Co-Design team at the University of Sydney, as part of their Connected Learning at Scale project, worked with academic partners, learners and industry to develop self-paced and interactive online modules to replace lectures in large subjects. The project aims to foster true flipped learning and to provide learners agency in navigating the content and integrates multiple perspectives into the learning resources.

Online Interactive Oral Assessment

Danielle Logan-Fleming and Popi Sotiriadou from Griffith University implemented the online interactive oral assessments to achieve a more secure, authentic form of assessment over traditional exams. Learners work in teams in an unscripted interaction with an examiner to verbally demonstrate knowledge while participating in an activity representative of a workplace scenario.

in a strong desire to return to campus for some learners and staff, while others valued the flexibility of working from home. It is likely that the role of campus spaces will evolve, with learners taking advantage of opportunities to gather on campus but also leverage the affordances of social technologies to enable them to learn through networks, sharing and collaboration, in online communities as well as in face-to-face settings. Institutions will need to consider ways of facilitating the interactions of learners and staff, with online learning environments having an expanded role.

Active learning is effective and more inclusive than traditional didactic lecturing. It can also help promote equity in higher education, even if some learners enjoy group work and collaboration less because of the increased cognitive effort required. Learners need to understand the benefits of active learning to take charge of their education, and online platforms can provide a vehicle for such participation. Lively debate and discussion in synchronous tutorials can occur in multiple spaces, including online via social networks, in Microsoft Teams, in Zoom classes, breakout rooms and via tools such as Padlet; learning is not restricted to campus classrooms. Asynchronous discussions with rich media content can also be engaging and reflective with tools such as VoiceThread extending the functionality of online text-based discussion tools to provide a human touch.

Exams and lectures are traditionally designed to transmit and test learners' mastery of content. Similarly, a shift to online exams during the pandemic largely involved pen-and-paper exams being reproduced in online formats.

Higher education needs to mainstream assessment design that better prepares graduates with 21st century skills for an ambiguous future. Although the assessment, supporting learning activities and delivery methods all need to be constructively aligned to the desired learning outcomes, new ways of thinking about assessment need to be canvassed. Widespread use of online invigilation of exams during the pandemic has exposed how stressful the experience can be for learners, while perpetuating an inauthentic method of assessing learner capabilities to solve problems in the real world. Some higher education institutions try to use AI to supplement human teachers in the assessment and invigilation without changing the perspectives of assessments. Ngee Ann Polytechnic in Singapore has been trialling the use of AI for marking, and remote exam invigilation. Although the Australian Government–funded project Transforming Exams provided examples of how we can increase the authenticity of online exams at scale, we can also learn from innovative educators who explore alternative assessment approaches, such as online interactive oral assessment at Griffith University (see Logan et al., 2020), collaborative online exams at the University of New South Wales (see Kellerman & Betts, 2021), and virtual WIL supplemented with simulations at the University of Western Australia (see Male & Valentine, 2019). Apart from assessment that is authentic, scalable and valid, learners benefit from choice in how they represent what

Transforming Exams

Transforming Exams aims to enable authentic, high-stakes assessments that empower learners to demonstrate employability requirements for 21st-century learning, using bring-your-own-device (BYOD) capability for campus-based exams. The e-Exam software and guides and research are publicly available through the project's website. Funded by the Australian government, the project is a partnership among 10 Australian universities.

they know, and how they engage in the learning and assessment process.

Educators in Australasia have been quick to adopt online conferencing technology during the pandemic, notably Zoom because it was relatively easy to access and use (despite the occasional Internet dropout). It became readily apparent that translating face-to-face methods and expectations to the Zoom classroom was a challenge for many educators unfamiliar with the new way of working. The role of academic developers has been critical in helping educators to design learning experiences that can exploit the affordances of these online technologies, such as effectively using chat, sharing whiteboards, editing documents collaboratively, strategising the use of breakout room activities and timings that work best in such spaces and rethinking didactic delivery into something that is interactive and collaborative (see Bryant, 2022, for an example). Educators need more time to tap into support models, exemplars and encouragement to be able to realise the potential of online facilitation. Although there is already a long tradition of early adopters, e-learning champions and online and distance education technology research to draw from, the pivot to remote learning was so rapid that there was precious little time to find and apply this knowledge and skills. If anything, the mixed success of the rapid switch to online delivery has highlighted the scale of effort and resources involved in producing quality higher education in distributed modes.

Higher education learners are choosing the convenience and flexibility of online learning, and it is therefore less likely that higher education will flip back to face-to-face teaching to the same extent as has occurred in the school sector. Learners in higher education are largely there by choice and will likely select providers that enable them to juggle study as part of their increasingly complex lives.

AI educational applications such as intelligent tutoring systems and automated response systems may also assist learners to learn at their own pace and preference in certain discipline areas. By allowing learners to explore concepts and practise core skills with adaptive AI applications and automated formative feedback, teachers can focus on facilitation and being a guide-on-the-side for learners. Microsoft Qbot developed in collaboration with the University of New South Wales is an example of an AI-infused agent that has been trialled in large blended and online UNSW engineering courses with positive outcomes. Singapore Management University has been able to leverage AI to custom-build tools, such as Peer Evaluation Tool, to encourage collaborative and peer learning. The technology that enables automated or supported grading has been present for a number of years. However, anything outside of selected response formats such as multi-choice questions has seen only limited use in Australasian higher education.

Higher education has been slow to grapple with the possibilities and role of AI and adaptive and automated tools in teaching, and how algorithms might reshape education in unexpected ways. Although

there have been some budding implementations of using AI technology in educational delivery, such as National University of Singapore's Yong Loo Lin School of Medicine using AI simulation application Pass-It to train medical learners on various medical procedures, uptake on the use of AI has been traditionally low (United Nations Educational, Scientific and Cultural Organization, 2019). Further research is required to see if such tools are suitable in the Australasian context and in disciplines where responses to problems are less structured.

Changing university systems, processes, human and physical resources that are allocated around lectures and exams is challenging, despite evidence that active learning is more effective. Academics will default to lectures and exams without knowledge of feasible and institutionally supported alternatives. Hence, the leaders of higher education institutions must be prepared to support the exploration of practices on the horizon that are working at scale or have great potential.

Self-care and wellbeing for staff and learners

The pandemic shed light on mental health and wellbeing for both staff and learners. Higher education staff shifted quickly to remote teaching and rapidly adopted new skills to deliver learner experiences online. The pandemic has raised issues around workload recognition and staff burnout, particularly as staff continued to respond to extended lockdowns and frequently shifting priorities as institutions continued to navigate their pandemic responses. Learners experienced isolation as they studied from home and, in some cases, financial instability as businesses closed. University counselling services were solidly booked out and struggling to cope with learner needs.

Thus, self-care and wellbeing for staff and learners across Australasia are vitally important. Staff became much more aware of their mental health needs, while simultaneously learning how to support their learners. The pedagogy of kindness movement, while having existed for years, gained wider attention. Making connections with learners, particularly online; creating a sense of belonging; empathy; learning choice and flexibility have become increasingly important. In short, fostering a pedagogy of kindness (Daniel, 2019) may assist both learners and academics with wellbeing (O'Shaughnessy, 2020).

Adopting the pedagogy of care has been shown that through "fostering an inclusive and culturally safe online environment where students experience a sense of care" (Burke & Larmar, 2021), and while online pedagogies continue to increase, this is an important consideration for the future. While acknowledging the impact of the pandemic in New Zealand, initiatives are available for wellbeing in education settings including the Tertiary Wellbeing Aotearoa New Zealand network. Health promotion using the Okanagan Charter is also important, with the two calls of action: embedding health into all aspects of campus culture and leading health promotion action and collaboration locally and globally (Community & Public Health, 2022). A range of resources were developed for learners around their wellbeing while studying at a distance during the pandemic. Various universities also supported learners during the time. Staff resources were also developed during the time with information from the Ministry of Health.

One Fiji study, while focusing on school learners, suggests that wellness in Fijian learners is more than physical exercise but rather is multi-dimensional. This includes diet, physical fitness and exercise as influencing factors. The belief and findings of the study suggest that spiritual wellness, along with wellbeing and self-care, is important as it is influenced by families, peers and social media, and this connection is important.

In Australia, some professional bodies are recognising self-care in their registration requirements, with one example being the Nursing and Midwifery Board of Australia, resulting in at least one Australian

Intentionally designed activities to support learner self-care and wellbeing

The University of Sydney School of Business intentionally designed, developed and embedded self-care and wellbeing into The Future of Business, a core unit in the undergraduate course. The learning experience has been designed with learner choice in mind, giving learners control over the sequence in which they examine course topics. Learners also explore their sense of purpose and personal journey and values and design thinking as part of the course.

An Online Pedagogy of Care

Katie Burke and Stephen Larmar from the University of Southern Queensland have developed an approach to ensure learners maintain a sense of identity and connection in virtual learning communities. Strategies include person-centred online interaction, responsiveness and compassion, creative use of technologies to foster interaction, and purposeful feedback.

university implementing a subject on self-care practices, with the hope that it will not only support learner wellbeing but also reduce attrition through increasing learner resilience (Mills et al., 2021). This shows that impacts for the region in learning and teaching are important and bring self-care and wellbeing to the fore of these occupations.

In Australia, the mental wellbeing of Australian learners is described in the Equity Fellowship Report (Crawford, 2021). Although the report focused on the mental health and wellbeing issues pertaining to mature-aged learners living in regional and remote areas in Australia, the recommendations and guidelines are adaptable to ensure every learner's mental health and wellbeing. The Australian University Mental Health Framework (Orygen, 2020) also focused on higher education learners in Australia to ensure that universities engage in collective ways of supporting learners with mental health and wellbeing issues to complete their education successfully. The programme stems from research showing these learners are most at risk of attrition.

In various countries such as Australia, Cambodia, China and Malaysia, there are innovations in learning and teaching to support learner and staff wellbeing. Digital resilience is becoming more important with the shift to online learning and teaching across these countries. It is important to ensure that when courses are delivered online there are multiple levels of digital competencies and that these are included to ensure learners have an enhanced course experience that facilitates their wellbeing and self-care. For Australian learners, building more interaction in online discussions was a focus, as was monitoring the quality of online teaching, but in China, the focus was on providing two-way communication to ensure learning was effective and interactive. Cambodia provided workshops on digital literacy to staff and learners and reduced Internet fees paid by learners. In Malaysia, there was also a focus on digital literacy for staff and learners (Eri et al., 2021).

Online embedded self-care and wellbeing module

The University of Melbourne implemented the Joining Melbourne Modules, a series of online modules that all undergraduate learners complete within a wider disciplinary discovery subject/experience. One module, Your Wellbeing and Success, supports learners in preparing for the transition to university and the strategies and supports available to them. The perspectives of undergraduate learners and experts discussing wellbeing challenges and how to overcome them are integrated throughout. The module encourages learners to reflect on what success and wellbeing mean to them, not just academically but more broadly in their lives.

Continuous Customised Communication

Mamun Ala of the Australian Institute of Business uses personalised messages to enhance teaching presence, learner engagement and wellbeing in online learning. He sends the messages at start of session and before and after assessments, which has contributed to increased learner engagement, motivation, wellbeing, academic performance and retention.

Blended learning models

New blended learning models have emerged across the Australasian region as the pandemic continues to disrupt the status quo. In Australia, the dependence on international learners severely impacted higher education institutions across the first 2 years of the pandemic, leading to cuts in both jobs and course offerings (Tjia et al., 2020). To manage the uncertainty of the pandemic, return to campus, and a mix of learners able to return to campus and learners who have no choice or who would prefer to stay online, institutions by necessity have had to adopt new hybrid scenarios to engage learners.

Blended models include a combination of teaching and learning delivery modes, including blended synchronous learning (BSL), dual delivery, hybrid and hyflex. Universities throughout the region have developed their own definitions and practical solutions for dual delivery and BSL approaches, which may or may not align. During 2021, the more traditional campus-based institutions converted classroom technologies, adding BSL equipment. New ways of delivery of lecture-equivalent materials, live-streaming of lectures as well as increased interactivity in lectures have emerged. Flexible teaching models and institutional offerings continue to evolve in response to the pandemic, and at least a degree of blended learning is here to stay (Kellerman & Betts, 2021).

Factors shaping blended models include time zone implications, location of learners and the ratio of online and on-campus modes, learner demographics, cohort size, discipline variations, equity in activity design, flexibility, access to technology, rethinking of synchronous and asynchronous learning components, digital assessment, new modes of assessment and exceptions in assessment. Assessment practices, and particularly high-stakes exams, are the slowest area to change (Deneen, 2022).

Concerns are shared around improving learner experience, connecting cohorts, learner engagement and equity of learning experience across the blended modes. The common challenge that has emerged is how to optimise the learner learning experience across the challenges of hybrid and BSL. Success is dependent on equipment and the management of that equipment. The cognitive load of teaching staff and the hidden labour involved in the emerging practices supporting blended models is noted. Alongside this, learners also experience engagement fatigue, with multiple avenues to ask questions and make comments causing a disconnect between the method of questioning and the method of teaching (Boye & Machet, 2021).

In the first part of 2022, some institutions appeared resistant to the idea of embracing the opportunities of blended modes and continuing with emerging modes; instead preferring a return of on-campus pre-pandemic business as usual. Others have continued to offer lectures only online (Carey, 2022). It is predicted that return to on-campus

Hybrid Teaching in Large Collaborative Classrooms

To take advantage of large collaborative teaching spaces post-pandemic, the University of Technology Sydney's LX.lab adapted pre-pandemic face-to-face activities — icebreaker, group collaboration, bracketology exercises and catalytic questioning — into COVID-safe hybrid activities. The adapted activities enable learners to participate, whether they are joining on campus or online.

Prioritising the Online Learning Experience

Deakin University's CloudFirst Project reimagined the curriculum to enable full flexibility of delivery, applicable to a variety of blended learning models. Learners engage with self-directed online learning activities complemented by real-time teacher-guided active and collaborative sessions. Templates support the large-scale uplift of digital accessibility across Deakin University.

teaching will continue to increase into 2023, with dual delivery and online modes being reserved for specific programmes such as postgraduate courses and individual subjects. Kellerman and Betts (2021) have argued that Australian higher education leadership lacks vision in looking to the challenges as an opportunity to grow and innovate.

However, the expectations of learners towards educational qualifications have shifted over the past 2 decades, and student expectations further shifted during pandemic. Furthermore, socio-economic pressures have continued to shape the general population's expectations and understanding of what education means. During the pandemic, some professions (such the retail and hospitality) came to a complete halt; others (such as health, science and education) continued to function and often increased their effectiveness and efficiency in building skills, resulting in a global shift in the mindset regarding education and its purpose.

As institutions balanced such considerations as learning preferences, socio-economic situation, lifestyle and accreditation requirements, new approaches and realisations regarding the capabilities of remote learning emerged as well. The benefits of this shift provided learners greater flexibility for work-life balance together with possibilities of work integration with their choice of study. Learners could better co-mingle study and other responsibilities into their daily lives.

With many having experienced flexible education, future learners are expecting remote learning to be part of the learning experience. Further, they are likely to continue to prefer to have the option of online and on-campus learning (Tertiary Education Quality and Standards Agency, 2020). Although learners missed the psycho-social aspect of being on-campus, online delivery provided the flexibility of choosing when they wanted to study and how. The reduced barriers of enrolment as higher education institutions worked to offer equitable access to all enrolled learners regardless of location or access requirements. This has also meant that equitable and inclusive learning has become a focus and is more "visible" for all.

In addition to flexibility, learners want educational qualifications grounded in authentic work, in preference to theory alone. Studies (e.g., JISC, 2021) have indicated that as undergraduates commit their time to study, they want to be job ready; thus, WIL is an imperative rather than a nice-to-have inclusion. This coincides with employer expectations for job-ready graduates. Blended learning delivery will need to consider how to bring this dimension into play.

There is also a concern to develop lifelong learners over the achievement-focused notion that traditional certificates or qualifications are the end point; they are, quite simply, an entry ticket. As industry moves quickly to adapt and adopt new practices to meet the needs of the changing world, so too does the need for their employees to continue to learn. Therefore, there is a greater demand from learners to seek shorter qualifications that are tailor-made to provide the skills for the job that they are doing or wanting to shift to.

Weekly Preview Video

Matthew A.M. Thomas at the University of Sydney recorded weekly videos in Zoom to connect with students and to introduce critical readings and other material for the upcoming week. The videos contributed to a broader sense of connection to the unit, the content and to the instructors and lecturers.

Universities around the world are forced to reconsider the types of courses and qualifications they are offering and incorporate microcredentials as part of their offers.

For universities to meet the expectations of future learners, authentic assessments that reflect the skills and knowledge required in their future workplaces must be provided; these will create a portfolio of knowledge and expertise to support the job application process. Universities must continue to explore assessment utilising technology and AI. Digital examinations (Deneen, 2022), self-invigilated, proctored and un-proctored examinations together with on-the-job assessments must form part of the teaching and learning assessment landscape, serving learners as well as their future employers.

Universities will continue to use a combination of online and on-campus delivery; what is needed is developing people's capability to use various modes of blended learning as and when required, by external and internal pressures.

Educational technology infrastructure to enable learning

Educational technology infrastructure is more than having an information technology helpdesk, it is about changing the way learners understand their own learning towards a real-world transferable experience. It means having access to the right tools and systems to support learners in learning and in contributing to a society where technology is ubiquitous and essential.

The pandemic and the subsequent response have highlighted the importance of educational technology infrastructure in higher education. In the pivot to remote learning, institutions discovered that a flexible approach to the existing infrastructure eased the shift to digitalising learning and teaching capabilities. This flexibility is a key capability of any institution, where not only the tools need to be considered to provide deep learning that is contextually and disciplinarily rich but also the pedagogic designs.

Generally, educational technology infrastructure refers to the connectivity within the learning environment. However, connectivity can manifest in many forms, but typically references the digitising of activities through the use of information and communication technologies. Solutions in this space are not constrained by the generalised definitions, as there is room to broaden this understanding, where support services are needed to facilitate the learning environment's ability to afford and, in some places, transform into connected learning ecosystems. As an ecosystem, the influence of its individual components can be measured through:

- access (e.g., data storage and backup systems, firewalls, cybersecurity)
- cost (e.g., paywalls)
- data literacies (e.g., analytics, apps)

Although Australia, New Zealand and neighbouring countries are situated south of the equator, they are known as part of the group called the Global North. This term, used to identify countries that are socially and technically well-developed, should also highlight that Australasia has several differences from the other countries in this group. Universities in New Zealand receive funding from the government as well as learner fees, whereas Australia's universities are mostly not-for-profit. This combination can suggest how resources – and by association, what factors –influence how infrastructure is provisioned. The understanding of governmental policies and laws guiding how and where data is stored, who can have and should have access to data, and when, and how costs are assigned and distributed, creates much to consider when looking at the infrastructure that should support educational technology-enabled learning environments.

The last 2 years have highlighted how different factors influence how learning is proffered. No longer can we only blame learners for their learning ability, as there is a need for learners to be embedded into

Purpose-built facilities

The University of Technology Sydney opened UTS Central in 2019. The building features two 350-person capacity and a 198-person capacity collaborative teaching spaces designed with acoustic considerations and the 270-person capacity Hive Superlab for science laboratory teaching.

Filling a niche

Pedestal 3D is an educational technology company founded at Macquarie University. The solution filled a gap in 3D object -based learning in archaeology, anatomy, geology and other disciplines at the university before incorporating in 2018.

learning systems that are sustainable, supported, sufficiently resourced and meaningful for society. Thus, a shared responsibility to create a learning environment that is conducive to the knowledge, skills, abilities and attitudes is a goal worth acknowledging. We all live in a connected world, and there is an expectation that learning in institutional environments should be transferable and reflect industry needs. This means that implementing technologies, new or otherwise, to enhance learning experiences is expected to support and prepare learners for the world they take part in. As such, what is important now is how does the infrastructure support the future of learning in this sector, and how does infrastructure, known for its physicality, embrace technology so that the sector is not reactionary but responsive, agile and reflective. Being responsive, agile and reflective requires constant recognition of the issues of access, cost and data literacy abilities as these will provide the necessary support.

With the efforts to ensure that institutional strategies are in alignment with the source of revenue streams, there may be a need for a shift in strategising as economies recover and re-engineer societal needs towards course offerings. Shifting fields of studies, re-calibrating research and teaching loads, adjusting for a variety of needs means that infrastructure projects may look different; for example, physical buildings which use traditional methods of delivery may require retrofitting to adjust for flexibility and access towards an appropriate service design. Flexibility could mean the need to adjust to the size of cohort, delivery methods (face-to-face, blended, hybrid, online), curriculum designs (e.g., co-designs or participatory designs with learners, industry, military and other stakeholders) and most of all interactive engagement (e.g., collaborative learning, cooperative learning) using technology tools (virtual reality and augmented reality, games, simulations). This is evident in the exemplars, where the transformation of teaching practices and the integration of software and hardware to support the learning experience took many forms; for example, creating online tools to publish 3D object data that were notoriously challenging online at Macquarie University, implementing apps such as Zoom and Padlet to create a Virtual Exhibition Poster hub at the University of Melbourne. There were some institutions like the University of Technology Sydney, with collaborative rooms created for multi-cohort size, group collaborations in both the science labs and general teaching spaces in place prior to the pandemic. These rooms mixed physical designs with technology to simulate a real-world working environment.

These exemplars create a new way to respond to the societal needs for more entrepreneurial learning spaces which are situated in transdisciplinary and interdisciplinary spaces. By considering the value of sustainable physical infrastructure, educational technologies, and the cognitive and pedagogical conditions to support an integrated approach in learning and teaching, we can create an enabled and empowering learning environment. It can in turn offer to learners a beneficial learning ecosystem in which they can with instructors create, extend, and innovate to grow the most important asset in any economy – knowledge.

Illuminated whiteboards

James Cook University adopted the Learning Glass illuminated whiteboard technology to improve learner engagement and understanding of statistical and mathematical concepts. Learners can see the neon marker on the glass surface with no occlusion. Lightboard drawing can be captured via video or transmitted through web conferencing technologies, such as BlackBoard Collaborate or Zoom.

As the educational technology industry continues to grow exponentially, so too will the educational possibilities for institutions to integrate varied technologies – digital and otherwise – into teaching and learning. Institutions may consider the following regarding their own educational technology infrastructure:

- **Equity and secure access:** As institutions continue to evolve their educational technology infrastructure, they must also consider the implications for learner and facilitators of integrating technology into the learning environment. As additional technologies are employed, the need for skill enhancement throughout the workforce will compel new ways of observing, applying, measuring, evaluating and researching. This is a core need to encourage equity with acknowledgement to differences, as it relies heavily on devices and secure and sufficient Internet access and bandwidth. It is hoped that access will be afforded with true understanding of the factors that characterise all stakeholders involved (i.e., learners, instructors, administrators) as the goal towards safety and accountability is addressed with regard to the complexity of each learning environment.

- **Context and complexity:** Higher education preparing learners for a digitally enabled world of work: Higher education institutions have widely invested in physical campuses for decades. With the renewed vision of higher education institutions preparing society for the world of work, how we support these ecosystems will be of high importance. A review of the current needs of higher education institutions will assist by addressing some long-standing discussions, such as academic integrity, encouraging designs that are grounded in problem-solving methods to embrace critical thinking and providing a curriculum that is authentic by aligning assessments with the world of work. This highlights the importance of flexibility and responsiveness in working with industry leaders to understand what technologies are on the horizon and how, from an educational technology infrastructure perspective, we prepare for them.

- **Flexible and evolving strategies:** Although educational technology can enhance the learning experience considerably, so too will the cost to implement and then support technology grow and maybe challenge this want. From licensing to capability building and infrastructure, the cost can be considerable. It is important for the sector to recognise the opportunity to maintain flexibility in offerings in alignment with societal needs, yet at the same time, have a strategic vision that evolves to create a stable educational economy. For example, microcredentialling is demonstrating how we might competitively offer just-in-time learning within the university model. The key is to expand into areas that will support a strategic vision for learning experiences that are wanted and valued.

Accessible content and digital equity

As educational institutions transition away from traditional face-to-face didactic delivery and towards synchronous and asynchronous delivery (including hyflex), new pedagogical practices and technologies that enable digital connection, teacher training in these new methodologies, and addressing learners' emotional and mental needs are required. In addition, institutions must address two growing interrelated practices: digital equality and accessible materials. Willems et al. (2019, p. 1) explained this interrelation as "a complex and multifaceted concept. [Digital equity] includes not only access to hardware, software, and connectivity to the Internet but also meaningful, high-quality, and culturally relevant content in local languages, and the ability to create, share, and exchange knowledge. Participatory citizenship in the digital era involves the right to access and participate in higher education. Indeed, it is a key civil rights issue of the modern world".

In recent years, the numbers of learners from marginalised groups have gradually increased. For example, Universities Australia claims 2020 estimates of 20% of overall learners reporting a disability, 7% Indigenous, and 2.8%living in rural locations. Universities NZ reports 11% are Māori, 8% are Pasifika learners. Stats NZ 2023 Disability Survey will report on tertiary education participation, barriers (e.g., accessibility of content) and support for disabled respondents.

Creation of accessible content that can support these, and other, marginalised groups, can be addressed at a high level by applying universal design for learning and evaluating technology and content from a variety of socio-technical perspectives. Goal 4 of the United Nations' 2030 SDGs is particularly meaningful: "Ensure inclusive and equitable quality education and encourage lifelong learning opportunities for all." and is supported by three noteworthy trends identified by the Sustainable Development Solutions Network – Australia/Pacific (2017, p. 24):

1. Aiding vulnerable and disadvantaged people, such as people with disabilities, Indigenous peoples and people in financial distress, to access and fully engage in university life.
2. Providing literacy and education programmes in communities and schools in the university's immediate vicinity and beyond
3. Providing learning environments that support and foster inclusiveness.

To improve the quality of higher education for all learners requires a combination of innovative learning techniques and improvements in instructor training. New pedagogical frameworks demonstrate promise in ensuring wider participation and student success. Lai and Bower (2020) provided a critical examination of educational technology and how it affects learning results, teaching and pedagogy, behaviour and emotional perceptions. They advise instructors to favour constructivist, social, gamified, learner-centred

Game-based learning for neurodiverse learners

Unitec Institute of Technology Aukland's Utkarsh Sanjanwala from the uses Classcraft and SIMS for game-based learning in the New Zealand Certificate in Skills for Living and Working (Level 1). The team have found that the game-based learning supports neurodiverse learners, who prefer predictable consequences for their learning, which is likely in game-based learning.

Accessibility basics

The Everyday Accessibility Basics, developed by Deakin University's Accessibility Champions Project, welcomes individuals to get started with inclusive teaching practices. The toolkit highlights six fundamental accessibility concepts that can be applied with minimum effort to maximize impact. The framework provides helpful tips for accessible headings, links, tables, images, videos and files.

and feedback-involved techniques. Lambert (2019) developed a strategy for increasing participation in open, online and hybrid programmes, which consists of six important dimensions: technology, autonomy, purpose, skills, social support and learning materials. While upskilling and supporting academics in leveraging new technologies and practices in improving quality and equitable access to learning. Brown et al. (2021) suggested that academics are central to course development, and that some aspects of quality remain directly under their control. Their active participation is critical for successful implementation of the online ambitions of universities. Pham Ngoc and Phuong Hoai (2021) recommended attention should be paid to exploring the technical and academic support that teachers require. In a recent panel on equity and inclusion, relevant discussion occurred about co-developing LMSs with learners, academics, professional staff and managers at different levels, with the objective of learning about their preferences in tools. Even though considered to be a transactional way of thinking, the topic of AI tools reducing academic staff workload by about half was also shared (Amos et al., 2022). Well-trained academics must be given time, resources and incentive to develop techniques in using learning technologies engagingly. Exemplar 1 offers one method to bring fun back into the classroom, providing advice from an individual educator working with children with neurodiversity in a gamified learning environment.

However, one of the most prevalent barriers to digital equity is lack of access to digital infrastructure, including computers, software and the Internet. The difficulties connected with bridging this gap are complex, necessitating institutional, business and government support, such as nationwide broadband, LMS content that works on mobile and desktop computers and universal software that can function across many operating systems.

To support digital access and equity, institutions must consider where their offerings sit on the continuum between face-to-face on-campus and fully online experiences and choose strategies that are appropriate for their current context while also considering strategies to improve content accessibility and digital equity. Among the strategies that could be used are:

1. Apply universal design for learning to a class where not every learner has access to a laptop or desktop computer.
2. With educational expertise and training, address unequal access to digital content.
3. Provide digital content in pedagogically sound, equitable and accessible ways.
4. Design for long-term high flexibility to accommodate cohort variety, including learners who want to be able to engage when, where and how they choose.
5. Include human-centred design in the construction of culturally sensitive, accessible, flexible learning.

Inclusion resources

The UTS LX.lab Inclusive Practices Team produced a collection of digital resources to support teaching staff with digital accessibility and accessible content formats. These resources are freely available.

Hybrid Model United Nations

Okayama University's Model United Nations class transitioned to a hybrid format as a result of the pandemic. Learners in Japan met face-to-face and were joined virtually by learners from Spain and Taiwan. A blend of technologies, including the LINE instant messaging app, Moodle, Google Docs, and Flipgrid enabled a transformative learner-centred experience. Learners contributed decision making for some of the tools selected and formed a community of practice around Model UN process and procedures. Instructors and learners worked together to negotiate the new learning environment.

Including learners as co-designers or research partners is becoming more common (e.g., STARS conference). Academics and learners could collaborate to create preferred and adaptable learning activities and environments. For example, three or four learners in a classroom may come from an Indigenous background, and one learner may have a learning difficulty. As a result, the academic could consider how to make their flexible learning curriculum culturally responsive to and inclusive of these pupils. This process of establishing a course or a subject could turn into a dialogue between the academic staff and the learners. Adopting these measures will assist universities in establishing a solid foundation for their goals of accessible content and digital equity.

There are increasing examples of equity, inclusion and pluralism within the university experience and curriculum in our region. Higher education institutions learned a lot about learners' access to devices and Internet connections during the peak of the pandemic. For example, an Auckland University of Technology study (2021, p. 12) performed towards Alert Level 4 found that up to 1 in 6 learners lacked the prerequisites for online learning: a device and access to the Internet. Over the course of 2020, the institution provided 1,000 laptops and 720 Internet connections in what became known as the Digital Equity Initiative. Although some of the costs were ultimately covered by government financing, Auckland University of Technology had approved the project well before the government announcement. Digital equality is a vital component of learner achievement, and colleges such as AUT are now working to integrate this project into their regular offerings.

Physical spaces of universities are undergoing changes to accommodate diversity in modalities and people with disabilities, and campuses are being established in different regional areas (McCowan, 2022). Furthermore, individual academics are carrying out projects in which they engage with their learners who have learning disabilities (Kane, 2021; Newcombe, 2021).

Culture is being explored as a critical element to rethink online learning design that addresses educational inequity and enhances the learning experiences and outcomes of Indigenous peoples. Conceptualisation and promotion of hybrid models informed by Indigenous learning principles are being promoted. Brown et al. (2021) explained that addressing inequalities online encompasses complex challenges that cannot be simply solved through a systematic distribution of devices. In addition, inequality is relational and not necessarily compounded. Values such as building relationships and caring are crucial for Māori and Pacific learners' success in online learning. Therefore, they believe foregrounding approaches (e.g., cultural competences for teachers) that support culturally responsive pedagogy will enable all learners to successfully negotiate learning in online spaces. Reedy (2019, p. 132) demonstrated the efficacy of combining a Western methodological framework with the Indigenous method of yarning. The purpose was to address the educational inequity that Aboriginal and Torres Strait

Islander people have experienced in higher education in Australia, and the yarning has been replicated in virtual learning spaces.

The Global University Network for Innovation's report (2022, p. 9) highlights the fact that most universities in developed countries have established advanced digitalisations and have responded more satisfactorily to the pandemic crisis, while universities in developing countries that have less experience of digitalisation are facing serious difficulties in meeting their learners' needs and subsequently impacting their education. International cooperation between universities in developed and developing countries is a recommended approach to prevent the widening of this gap.

Open education, accessible formats and collaboration between developed and developing nations' higher education institutions may help to solve concerns such as advanced digitalisations and the role of businesses in the digital education boom. Universities and polytechnics from Australia, New Zealand and the Pacific are well represented on OERu (OERu, 2022), with the University of Southern Queensland, Curtin University, AKO Aotearoa, Otago Polytechnic, Western Pacific University, The University of the South Pacific and Asia E University among the partners. For people with access to the Internet, this platform appears to be addressing concerns about accessible content and promoting cooperation between developed and developing countries through free content and low fees for certification. OERu appears to be a good example of collaboration and resource sharing between higher education institutions.

Co-design of higher education

Co-design supports a participatory approach to designing solutions. Co-design as a practice is well-received in other sectors; however, higher education is only starting to see growth in this area. In higher education, co-design efforts focus on learning outcomes and the learning experience. Institutions are co-opting learners and industry partners to connect learning with real-world and authentic experiences with the aim to make learning as meaningful as possible.

Many institutions use the word "transform" to describe how they wish to change or improve the educational experience for their learners. We often assume that technology will be involved in such transformations, particularly when we talk about innovation. Technology has created more opportunities for learners and external partners (such as industry experts) to participate, thus enabling the co-design process. Furthermore, technology has enabled communication and connection to facilitate a greater level of collaboration in the co-design process. Although research suggests that co-design practices in education are often associated with the design and implementation of technological tools to support learning, co-design process may also be used to address the design of curricula more broadly. Online modules, assessments, educational and support resources, massive open online courses and university learning infrastructures are all examples of areas to which co-design has been applied.

However, what makes co-design particularly interesting and innovative in higher education is its application in the learner experience. Pedagogical transformation is not a process of transition and replication. Likewise, it is not a process of redesigning afresh to remove the undesirable, as there may well be pedagogically sound approaches already occurring. Authentic transformation looks at the same set of tools, techniques, knowledges and skills and sees different and creative patterns and connections in them. Co-design is a process that harnesses these perspectives, supports them with process and capability and deploys them to teaching and learning (Wilson et al., 2021).

One of the most exciting developments in relation to co-design is the acceptance of learners as partners. This can take many forms, including curriculum design and pedagogic consultancy. However, it also comprises learner-driven communities and social interactions. The learner as "client" is fundamental to the design process. When learners are involved in the process, there is greater potential for significant buy in and engagement in the learning.

Co-design for learning that engages learners in curriculum design and development processes is not limited to learners participating in course evaluations and committees (a practice often referred to as incorporating the learner voice). Rather, it involves learners working together with faculty in the process of design and inquiry. This is consistent with the characteristics of co-design more generally and in

Aligning academic and career skills

Macquarie University redesigned their Bachelor of Arts programme in consultation with industry leads to provide students with a deep understanding of disciplinary and transferable skills. Students can now visually showcase their skills and demonstrate the alignment between their academic work and job requirements.

Business co-design

The University of Sydney Business School's Co-Design Team leverages connections between students, disciplines, industry and society to enhance student learning in large cohorts. As part of the project, students contribute resources used in their learning activities and use tools to evaluate their own work.

what is commonly referred to as user experience design in industry. The underpinning philosophy is that learners are included in the process of designing their learning journey.

Co-design may be applied in small portions of a larger course or programme; for example, a flexible approach to assessment in which learners are provided opportunities to not only choose their own topic but to also develop ideas and projects that are relevant to them and their context. The openness of the assessment design and the assessment outcomes in this instance represent a co-design approach.

However, for learners as partners to have the potential to help transform the nature of higher education, we need to go beyond individual initiatives and embed co-design in the culture of the institution. We believe we are starting to see this through examples in our region. For example, Western Sydney University's partnership pedagogy is the co-creation of curriculum with learners and other partners. As a curriculum principle in the university's Curriculum Design and Approval Policy, it is a signature concept in the shaping of curriculum transformation at Western Sydney University.

There are still tensions around co-design processes that are in part due to the perceived needs of the institution and of the individual educator, not to mention the various "actors" involved in the process. To support co-design more broadly, there needs to be adequate professional development, guidance and support for instructors who need more specific pedagogical content and metacognitive knowledge to successfully integrate deep pedagogical changes in their learners' learning experience.

Co-design is a philosophy and an approach that could be used to design more than the curriculum. The health sciences have long been co-designing programmes with the community, and there are emerging areas of co-design for social justice. University governance bodies are also beginning to take notice of the impact of co-design to move beyond the engagement and consulting stages or "doing for" towards a more equally power balanced approach of "doing with". One example is the participatory design of pathway resources and interventions, co-informed and co-designed by participants and (marginalised) communities, including a template for a university-school partnership agreement (Dollinger et al., 2021). As yet, there is a dearth of published literature in this space and a gap for future research.

Students as co-developers of curriculum

The University of Sydney and the University of Otago students and academics co-design portions of the Opthalmic Science programme. Early-career medicine students study ophthalmology in an asynchronous learning environment that seamlessly blends content and discussions. Students and academics co-design assessments, and students often control the decision making over wikis, journal clubs, and student-delivered lecture content.

Microcredentials

Microcredentials comprise a diverse range of shorter offerings outside the traditional higher education degree programmes delivered face-to-face, blended or fully online. They include short courses, continuing education, nano degrees, micromasters and certificate programmes. However, they are not to be confused with digital badges, which, while an element of microcredentials, are primarily a means to convey evidence of the completion of a credential.

Contextualising Horizon panellists nominated microcredentials as both a social trend and one of the key technologies and practices for 2021–2022, identifying both microcredentials' potential impact on higher education and their role as a response to the STEEP trends. Increasing industry and political interests in microcredentials have contributed to their socialisation in higher education. Furthermore, there is an evolving interest in using microcredentials to address education access, workforce skills gaps and economic and political imperatives as well as a remedy for disruptions to individuals' educational attainment and reskilling.

In the Australasian context, the development of microcredentials can be best described as emerging. The institutional development of microcredentials has largely been happening in parallel with national and institutional policies. National policy frameworks have aimed to establish quality and standards and frameworks for the recognition of credentials. Meanwhile, institutions are defining credentials and establishing internal policy frameworks and processes to support the implementation of credentials. In a sample of institutions from Australia, New Zealand and Fiji in 2020, only about 50% had developed institutional policy around microcredentials (Selvaratnam & Sankey, 2021). Ultimately, the negotiation of the national and institutional-level policy infrastructure has impact for the development and wider acceptance of microcredentials by providers and industry and the value of microcredentials to learners. Across the region, nations have achieved varying levels of maturity at the policy level.

As microcredentials adoption continues to emerge, further evidence is needed to support the claims about the value of microcredentials and to address the criticisms. It is still unclear whether microcredentials fulfill either learner or industry needs.

Given the shorter duration of these offerings, microcredentials are positioned to be more responsive to the rapidly changing world of work and provide the ability for individuals to engage more flexibly in education and lifelong learning. Learners would be able to take smaller units of study to obtain the knowledge and skills to achieve their educational goals and to potentially even stack credits to achieve higher-level credentials. For learners who may not be able to dedicate the time or financial resources to a full degree programme, microcredentials may be attractive and achievable options to accompany a full-time work schedule. Furthermore, for learners

Central portal for pathways and providers

The Singaporean Government's SkillsFuture initiative maps career options, skills and microcredential options through a central "marketplace model". Furthermore, the government provides citizen with a S$500 credit towards credentials.

Large-scale institutional credentials development

RMIT University has developed and curated a bank of more than 150 career-ready short courses and credentials, including a number of credentials developed in partnership with industry. RMIT Creds are free for RMIT students and available to the general public for a fee.

whose education has been disrupted, these credentials may provide a means for continuing their studies in more manageable chunks.

The emergence of industry-specific credentials poses a potential risk to the higher education sector. Corporations, such as Google and Amazon Web Services, now offer courses specifically tailored to preparing learners to become job candidates in high areas of need. These direct pipelines into employment areas of high demand, while offering alternative pathways for learners, do represent a new line of competition for higher education. Although not yet a widespread practice, this potentially undermines higher education enrolments and introduces new competitors into the market.

The potential of microcredentials to create alternate pathways addresses many of the concerns identified in the STEEP trends. In terms of the social and economic impacts the pandemic and disruptions attributed to climate change (fires, severe weather events, and floods), microcredentials enable pathways for job retraining and could enable alternate pathways to degree attainment. During the height of the pandemic, workers in industries that could not easily transition to remote work faced redundancy and were required to rapidly reskill to obtain viable employment. Learners contended with interrupted and delayed studies, learning deficits resulting from missed engagement opportunities and mental health and wellbeing challenges induced by increasing uncertainty and volatility.

The possibilities are tempered with a healthy level of criticism. Currently, we are seeing emerging models for these credentials, whilst there is still insufficient evidence to declare that microcredentials fulfill all of these promises. The opportunity for learners to choose credentials and pathways from which they will derive value and that will position them to be employable may not be clear; thus, approaches to support and guide learners in this space are important. Furthermore, microcredentials have been criticised as revenue generation and contributing to the continued commodification of education, thus continuing to perpetuate inequities. More work needs to be done to determine the most effective microcredentialling models, the costs and learner returns on investment over time and industry uptake and recognition of the credentials.The evidence about the cost and the value of microcredentials has been slow to come to the fore. A greater emphasis has been placed on policy development. Across the region, policymakers and stakeholders have been defining microcredentials and developing frameworks that support and align microcredentials with existing qualification frameworks. These policies set the standards for quality and aim to enable the transferability and stackability of the credentials. Further, the policy development underscore efforts to ensure that credentials provide a meaningful statement of learner qualifications for industry. Examples of policy frameworks and initiatives across the sector follow:

- **Australia:** Microcredentials featured in the 2019 review of the Australian Qualification Framework. A portion of the review

Co-curricular credentialing

The University of Melbourne has launched the Melbourne Plus, a co-curricular collection of digital credentials to help students develop skills in people leadership, innovation, community engagement and sustainability advocacy.

sought to determine how to incorporate microcredentials into the framework. Ultimately, microcredentials and other short course offerings were excluded, to reduce the administrative burden involved with reviews and approvals. Meanwhile, the former Minister of Education, Skills and Employment, Dan Tehan, announced in June 2020 $4.3million investment in a microcredentials marketplace to enable Australians to compare and select courses to help them upskill. In early 2022, the National Microcredentials Framework, which sets out the national definition for microcredentials as well as principles for quality and standards and critical information requirements, was introduced to assist consumers in choosing courses. Given the recent change in government, plans to restructure the Department of Education, Skills and Employment have been announced. As a result, the continued government emphasis on, and support for microcredentials, is uncertain.

- **Hong Kong:** Established in 2016 and currently undergoing a review and consultation period as of June 2022, the Credit Accumulation and Transfer policy, principles and guidelines are designed to assist providers in recognising qualifications obtained by a learner from other sources with the aim of reducing time studying and enabling progression across programmes. Although the framework does not explicitly mention microcredentials, they would be considered.

- **New Zealand:** In mid-2018, the New Zealand Qualifications Authority began accepting applications to register microcredentials from tertiary education organisations. The framework offers the ability for professional associations to work with a tertiary education organisation to develop a microcredential.

- **Singapore:** Introduced in 2015, the Singapore Government's SkillsFuture programme connects learners with short-form training programmes by industry. Singaporeans over the age of 25 receive credits to take part in a variety of lifelong learning opportunities. Users can look up career clusters and specific career paths and connect directly with training programmes tailored to career-specific skills.

As policy frameworks continue to be established and adopted and as microcredentials continue to become embedded within the Australasian higher education sector, the following will be critical questions for the sector to consider:

- Who are the learners participating in microcredentials? What are their journeys and learning pathways?

- Do microcredentials enable equity in access, attainment and employability?

- What support or guidance will learners require to make informed choices in credentials and learning pathways?
- What is the level of acceptance of credentials amongst employers?
- What is the cost-benefit of the programmes?
- What are the successful models of implementation?

Microcredentials are still in the very early stages of maturity. As the emphasis shifts from the development of policy frameworks and standards, there is an opportunity to continue to develop the evidence base and practices to ensure that microcredentials deliver on the promises of opening access to education and facilitating meaningful lifelong learning.

Methodology

The Contextualising Horizon Initiative used a combination of in-person workshops and survey research to arrive at the 2021–2022 technology and practice trends. We conducted two workshops on 29 November and 1 December 2021 as part of the 2021 ASCILITE Conference. During these first two workshops, ASCILITE community members and affiliates identified and discussed the Social, Technological, Economic, Environmental and Political (STEEP) trends likely to impact tertiary education in the next 12–18 months. Analysis of participant input, documents produced in the sessions and recordings of the sessions helped us to produce a final trends listed in the table below.

2021–2022 Contextualising Horizon STEEP trends

Social	Technological	Environmental	Economic	Political
1. Further diversification of student populations and digital divide 2. Microcredentials 3. Mental health & wellbeing	1. Student equity and digital equity 2. Online learning and faculty development 3. Widespread uptake of digital technologies	1. Sustainability 2. Climate change 3. Indigenous environmental recognition	1. Jobs: Insecurity, casualisation and staff retention 2. Financial insecurity 3. Resource-intensive priorities: Accreditation, work-integrated learning, and massification of higher education	1. Border restrictions and student mobility 2. Funding for higher education 3. Data privacy

Then, in February 2022, we held a workshop to identify the technology trends for 2022. During the workshop, participants were asked to consider the STEEP trends and the technology trends and practices likely to be important in the next 12–18 months. In total 15 trends were identified. Following the workshop, we reviewed the trends to refine the list, resulting in 11 possible trends. We distributed a survey to participants in the workshops and asked them to rank the trends with the intent of identifying the top six trends. The survey resulted in the selection of the seven trends highlighted in this report. Seven trends were selected in this iteration due to a 3-way tie among Accessible Content and Digital Equity, Microcredentials, and Co-Design of Higher Education (9.26%, n = 15).

Limitations and future enhancements

The identification of limitations and note for further improvement are integrated into the Contextualising Horizon process. Contextualising Horizon assumes an iterative design process to enable adaptability and continuous improvement. As the first iteration of the process, we assumed that there would be a fair number of revisions to incorporate for future iterations. The following are critical limitations and key areas for improvement:

- We think we will need to look at the connection between STEEP and the technology trends chosen and we will need to make this more explicit in future workshops for the next edition.
- We began the process with a narrow definition of Australasia, including only New Zealand, Australia and Singapore. Future iterations will incorporate efforts to expand scope to represent the Australasian region more broadly.
- Likewise, the participants in this iteration of the report largely represent Eastern Australia. As with the previous item, broader perspectives will be sought for future reports.

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