

## WORKING PAPER 9

### **The digital evolution of higher education: From high-cost failures to high-risk futures.**

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### The digital evolution of higher education: From high-cost failures to high-risk futures.

*Richard Watermeyer, Hanne Shapiro and Zan Chen*

#### Abstract

The societal contribution of higher education is for many inestimable and time-honoured. In an age of spectacular technological innovation, however, the role and relevance of universities is increasingly scrutinised and challenged. In this article we consider how universities are being impacted by and responding to a seemingly infinite emergence of new digital technologies particularly as relates to their role as facilitators of high skilled knowledge economies. We draw on the varied perspectives of those with intimate expert knowledge of the challenge of digital disruption to the global higher education sector and what the harnessing or refusal of digital technologies by universities means for the future of education and work. In so doing, we consider the contribution and limitations of universities in cultivating individuals who are not only world ready but world resilient; able to face and surmount the vagaries of digital transformation.

Keywords: EdTech; datafication; generative artificial intelligence; university leadership; future of higher education

#### Introduction

The impact of technological innovation on the world is vast and indisputable. Recent advances in digital and automation technologies are (re)shaping how we live and work. The speed of their evolution, however, makes it difficult to predict how we *will* live and work. It's not so much, that jobs of the future are an absolute unknown – despite the pervasiveness of such sentiment – in so much as the structure of work will change and require a different kind of skills-based interface built around technological efficiency and proficiency. And while the world of work is disrupted by technological innovation so too are the means of preparation for sustained and *meaningful* employment. Consequently, what we learn and how we learn and the value of such in terms of possibilities for work are subject to change.

The number of students entering tertiary education globally has more than doubled since the start of the new millennium, with the gross enrolment rate for women increasing from 19% in 2000 to 43% in 2022 (UNESCO 2022). Growth has been most marked in East Asia and the Pacific (+280%) and South and West Asia (+200%). Correspondingly, between 2006 and 2018, numbers of higher education institutions increased by 52% globally. In 2020, 235 million students were enrolled in higher education globally, two thirds of whom attended publicly funded higher education institutions. However, despite such upward trends, higher education participation in some country settings has more recently seen decline. In Finland for instance, numbers of adults with a tertiary degree (among the working age population) have dropped from 7.8% above the OECD average to just 1.2% above in 2021. In the United States, undergraduate college enrolment between 2019 and 2022 dropped by 8%; a plunge in enrolment reported as 'the worse ever recorded' (Binkley 2023). The value of tertiary

education to the changing world of work, economy and society appears thus never more contested. Yet their contribution is not just to the cultivation of knowledge and skills, workforce agility and resilience. It is a contribution to personal, social and cultural growth, as understood in the German tradition of *Bildung*<sup>1</sup>, that is of equal relevance and importance to future becoming.

In this working paper, we look specifically at the role of digital technology in reforming and restructuring higher education and thus changes to the contribution of universities as incubators of workforce talent in a digital era. We principally draw on the expert perspectives of digital and online higher education specialists – some working in global elite universities – in Australia, Finland, the United Kingdom, and the United States in addition to leading digital education scholars and expert commentators, and voices from those in the commercial EdTech sector to gain insight into the opportunities and challenges of digital transformation. Central to our discussion is the role of technology and how it is transforming or could transform higher education (HE) systems and the relationship of universities with the world of work and society more broadly, what is sometimes referred to as Education 4.0 (*cf.* Bonfield *et al.* 2020; Hussin 2018). In such terms, we ask, as have others (*cf.* European Parliament 2020), what will education look like in the future and what will be the impact of this to the world of work? While much is made of the impact of technology on education, both good and bad (*cf.* Selwyn 2021), we are interested in ascertaining the change effect of technologies designed for educational purposes or in other words, educational technology (EdTech), on the design and delivery of higher education. We also seek to understand how the commoditisation of EdTech and a sprawling commercial EdTech industry intersects with and challenges the pedagogical contribution of universities prompting reappraisal of the efficacy of their role in responding to the demands of a digitalised society.

We begin with a brief history that charts the evolving relationship of EdTech and higher education, before moving on to consider the contemporary challenges and opportunities posed by EdTech and, thereafter, the contribution in establishing a new value proposition for higher education in a digital age dominated by the rapid evolution of generative artificial intelligence.

### **EdTech and HE: A chequered history**

The progressive reform of higher education by technological transformation has been proclaimed since the first digital rush of the new millennium and the idea of the virtual university as a pedagogical utopia. Yet the triumph of technology so predicted has never quite materialised. In fact, despite huge financial investment, the technological reinvention of higher education has been plagued by a series of false-dawns and a history peppered with high-cost failures. Marshall (2018) provides an in-depth analysis and record of these failures which are variously attributed to the unanticipated expense of developing online courses; disagreement between partner institutions; low student admissions and high levels of attrition; excessive focus on content and materials over learning experience; over-estimations of the appeal of online learning; technophobia and faculty resistance to the enhanced use of educational technology where associated with EdTech as a commercial industry exploiting higher education as a corporate opportunity or as a threat to their jobs.

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<sup>1</sup> We take the concept of *Bildung* to mean the transformation of the individual and wider community.

The argument follows that while online education can provide rich and personalised learning experiences, it requires human intervention in the form of facilitated discussions, collaborative activities and feedback. Such concerns of online education have been especially prominent since the rapid emergency transitioning by universities to online learning, teaching and assessment as a consequence of campus closures caused by the COVID-19 pandemic (cf. Watermeyer *et al.* 2020). Universities' pivot to online, while ensuring continuity of educational provision, was lamented for providing students with an inferior learning experience and, in marketised university settings, low return on investment, provoking exhortations for universities' earliest return to in-person delivery (cf. Hall 2021). Supporters of online higher education have however since argued that the pandemic experience, provided a poor representation of online education and obfuscated its pedagogical advantages (cf. Watermeyer, Chen and Ang 2021). More recently, research has evidenced many benefits experienced from an albeit rapid emergency shift to online education during the pandemic (Bashir 2021) and students' appreciation of these (Morrison 2022) which has set the stage for 'hybrid' approaches which combine in-person and online modes of delivery and are considered vital to universities continued relevancy (Penrod 2022).

### **The EdTech Challenge**

For the Californian capitalists of Silicon Valley, proclamations of the death of the university may be explained by a purported commitment to cyber-libertarianism and knowledge democratisation or in other words a vision of technology as an enabler of freely accessed and experienced knowledge – an ethos that carried the first MOOCs – and a healthy distrust of knowledge elites and monopolies. However, the influence of the commercial EdTech sector over the future of higher education may again be greatly over-stated, although this has not prevented significant venture capital investment entering the market for higher education and vocational training. This faith in technological 'solutions' to education and labour market challenges is frequently shared by policy makers grappling with a changing world of education and work that is removed from the promise of the knowledge economy (Brown, Lauder & Cheung, 2020; Newfield 2016; Mirrlees and Alvi 2020).

Much EdTech is bound up in futures discourse and perpetual promise of change delivered tomorrow:

*“A lot of this stuff is just massively hyped and it's always speculative. So, education technology is a really terrible area to engage with because it's very future focused. It's always looking five years ahead. You'll hear lots of people talk about potential; what could happen; what is possible. And we have small proofs of concept but none of it ever gets scaled up in the way that you hear. It's a very kind of Pollyannaish type of sector. It's only ever looking for good news.”* (Australian Digital Education Expert)

When 'innovations' do land, the initial fanfare and noise that accompanies their market entry is found to quickly dissipate as focus shifts to successive market opportunities. Major investment fluctuations in the commercial EdTech market space emphatically reveal market volatility. A history peppered with failure also shows how commercial EdTech typically fails to monetise and sustain as a market commodity and tends mainly to operate on the fringes of higher education. Of all our interviewees working at the forefront of educational digitalisation in elite universities, their response to an apparently endless stream of commercial edtech solutions was one of disinterest. Moreover, universities 'progress' in the digital space and as

sites of digital conversion, was seen by the vast majority of those we spoke to, even in country settings like Finland that are noted for pedagogical innovation, to be slow:

*“We are still sticking too much into traditional way of thinking about education and learning, and there are still very, very clear silos between an education system and learning elsewhere.”* (Education Strategic Lead, Finland)

It is very difficult to conceive a future entirely absent of universities and degree-based education. Universities’ historical resilience to external change is testament to their capacity to survive transformational trends. Universities, especially *elite* universities, will more than likely continue to function as the primary conduit to a ‘high skills’ labour market. This in part is because the university degree is likely to continue to operate as a threshold guarantee of competency for a majority of employers (often as university alumni) who themselves may be unclear as to what specific skills or worker profile they really need or desire. However, notwithstanding the perceived durability of the higher education offering, it would seem unimaginable for it to remain unaffected by the winds of digital change. Indeed, for some, the prognosis is of significant sector-level reorganisation:

*“My usual spin on this is that will end up in 20 years-time with an online mass sector of virtual universities virtual schools providing lower cost, lower quality education to students that can’t necessarily afford anything better and then you just pay top dollar, for you know the kind of elites: Oxbridge, Ivy league, Russell group experience, where you have kind of a more of a face to face blended thing.”* (US University Director of Digital Education)

Others are more pessimistic and argue that the very model of higher education as provided within the archetypal university system is now defunct:

*“Education, as we know it today actually doesn’t exist. There really are no educational institutions anywhere in the world. There are certifying institutions . . . Education is not occurring and that’s a radical perspective, but unfortunately the evidence is incontrovertible. When you assess students at the point of certification, and you ask, “Can they actually apply what it is that they have learned?”, there is 100% failure rate. There isn’t an institution in the history of higher education that has been studied that has demonstrated the ability to teach students transferable skills. Don’t even bother. You cannot teach human beings transferable skills. At best teach them how to be critical thinkers.”* (US ‘Challenger’ University CEO)

It serves well to remember that motivations for initial university participation among students are varied and may not be exclusively tied to *educational* reasons. Universities provide a significant and highly prized chapter of social development (and social capital accumulation) in many young peoples’ lives, which explains why the pandemic engendered so much fear among institutional leaders, who recognised how closed campuses would impact ‘the student experience’ and threaten university finances. To break with the role of universities as crucibles of social development for young people, would go against the idea of the university as a crucible of learning, that occurs broadly in the formal spaces of the lecture or tutorial, and the informal spaces of social clubs and student societies. Thus, we would argue that universities will likely continue to provide for a mass-market of higher education, with prospect of greater

interweaving of digital tools ‘to develop the “full potential” of an individual’s capabilities (Bayne *et al.* 2020) and alternative forms of (micro)credentials into their offering as part of a ‘credentials rethink’ (Olcott Jr. 2022) and ‘unbundling’ of higher education provision. Universities are more than just degree providers as albeit tentative steps – facilitated by digital tools – into the continuous learning space reveal. Universities capacity to deliver ‘micro-credentials’ features, for instance, as a major aspect of a European higher education skills agenda (European Commission 2021) and are promoted as an educational resource for those typically unable to access traditional degree programmes (*cf.* Msweli, Twinomurinzi, and Ismail 2022). However, such policy initiatives are in part compromised by an innate ideological and financial conservatism in the organisation of universities which,

*“. . . affects the ability of higher education to develop continuous learning towards something which would be really valuable in the future. The model that they are going for now, there are no real incentives to really, really develop, for example, higher education in innovative ways, unfortunately.”* (Strategic Educational Lead, Finland)

The sustainability of universities as they are currently organised and the prospect of a less radically disrupted future for higher education may also be understood from the perspective of universities as particularly resilient and change-resistant organisations; evident no more glaringly than with a ‘snapback’ to pre-pandemic methods of taught delivery (Bryant 2021). The history of higher education shows that universities adapt more than completely change. Indeed, there is a rich history of universities adapting to economic conditions. In the current context for instance, we see public universities having to adopt more entrepreneurial forms of income generation where their patronage from the public purse is less assured. While universities may have always been inherently risk averse organisations they are now especially commercially sensitive and market responsive.

Perhaps unsurprisingly, universities use of and investment in technology is shown, certainly in comparison to players in other sectors, to lag. Investment in IT in universities tends to be very low; in many US universities technology spend may be as little as 6% of total institutional budgets. While reports place university technology spend in countries like the US at \$16bn annually, “the vast majority of university technology spend has very little to do with learning. It is mainly spent on IT services, hardware and devices, telecom services, data centres and software that helps universities operate as businesses” (Barosevcic 2021), and this constitutes a meagre proportion of median total expenditure (Kelly 2022)<sup>2</sup>. Moseley (2023a) furthers this assessment in reflecting upon a paucity of learning design maturity in universities and that “even though there are more roles and more talk – the conditions are not really there yet for learning design to become a serious feature of higher education”. In fact, he claims that the only tangible evidence of (cradle-to-grave) learning design is in the development of online courses and programmes. The ‘digital transformation’ of higher education, while becoming a growing concern among university leaders (O’Brien 2023) also remains a high priority among only a minority (Lederman 2023). To add to this there are also reports of an overall decrease by universities in technology spend (Grajek 2020; de Fremery 2021). Even during the pandemic, research reveals a limited procurement of technology services or products by universities, while in-house university learning technologists suffered significant work

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<sup>2</sup> Median spend on central IT for US institutions in 2020/21 was calculated at around 4.2% of total institutional expenditure (with significant institutional variation).

intensification (Watermeyer *et al.* 2021). Our interviewing of university heads of digital education in Australia, the US and the UK, further confirms that the (innumerable and persistent) advances of most commercial EdTech companies are ignored and unanswered by universities. Such an alleged dearth of university interaction with EdTech start-ups was rationalised by our interviewees on the basis of fit or rather lack thereof, and a failure of EdTech companies to fully grasp the complex operational basis of universities:

*“Ultimately, a lot of start-ups don't have the capacity to invest the time and effort to help understand universities in their context, which makes it very difficult to work with early stage start-ups and you know, sometimes even the most innovative solutions, you know, they pitch it as, “We can fix your problem”, without really understanding the complexity of the context.”* (US University Director of Digital Education)

The commercial EdTech picture outside of universities is also uneven. While the last few years has seen significant growth in the sector, and a flourishing of Edtech unicorns<sup>3</sup>, a willingness within universities to engage and experiment with an ever-expanding cornucopia of technological tools is less apparent. There is even evidence of universities drawing away from the commercial EdTech sector and in the US for instance moving away from their use of Online Programme Management (OPM) companies (Boyd 2023). This is not, however a universal picture. Moseley (2023b) reports steady growth in UK university and OPM partnerships. Country based variation reflects different regulatory frameworks and also ostensibly, universities having greater resource and being more risk-willing in committing to in-house development.

The vast majority of universities tend to be highly conservative in their use of technology, and especially so in the context of workplace skills and student employability. In fact, the end-users of most technology systems in universities tend not to be faculty but university administration and management (*cf.* Castañeda and Selwyn 2018). As we have already suggested, students haven't really been the focus of EdTech in universities, and pedagogy even less although with changes in learning habits and preferences initiated by the pandemic: an increasing use of mobile devices as a primary educational interface and focus on the value of gamification in boosting learner engagement (Yelenevych 2022), and significant scaling up of online education (Boggs *et al.* 2021), this is changing. Our interviewees reflected on an historical culture of digital avoidance in universities punctured only by the events of the COVID pandemic and a blind rush towards technology as a sticking-plaster, without any clear sense of future travel:

*“Universities have spent the last 10 years trying to pretend that digital wasn't happening and then had to lurch towards digital in the worst possible circumstances and are now hoping that the dust will settle and some kind of strategy will emerge.”* (UK University Director of Digital Education)

Despite a digital bounce in universities interest in EdTech its major application continues to be in marketing and recruitment. OPM companies, for instance, are called upon to take care of the design, operation, advertising and recruitment of universities' online programmes. The relationship between universities and OPMs is controversial, blurring as it does the distinction

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<sup>3</sup> Companies whose market valuation exceeds \$1bn

between for-profit and non-profit education. OPM companies typically pocket between 50 to 60% of tuition income, depending on revenue-share agreements (Carey 2019) – so millions of dollars flow to OPM companies who pay millions to the like of *Facebook* and *Google* for targeted advertising of their online degrees. With increased demand for online degrees, no longer viewed as second rate (Lederman 2018), even before the pandemic and the rapid transition to online, numerous universities, even the most prestigious like Harvard and Yale, are found to hire OPM firms to widen their student consumer base. Production and management for online degrees is routinely outsourced to OPM companies. Yet while EdTech companies look to sell their products to universities some higher education disruptors, like *Minerva University*, are looking to replace traditional universities from their hitherto monopolistic market perch, claiming greater relevance and efficacy through “commitment to reinvigorating their educational mission” and “complete institutional reform”. Ben Nelson, founder of *Minerva*, states:

*“Now is the time to redesign curricula, eliminating superfluous courses that have been added organically over the years. Now is the time to build intentional scaffolds, which combine the richness of interdisciplinary breadth with field-specific mastery and individual choice. Now is the time to establish sustained partnerships with the public, private, and social sectors to ensure we are able to graduate more informed, more engaged, more productive citizens in ways that are accessible to all citizens.”<sup>4</sup>*

While it is difficult to argue against many of these solutionist appeals, the embeddedness of a marketised, ‘prestige’ model of higher education, means the ‘problems’ of an HE system won’t easily disappear. Where criticisms of higher education’s neoliberalisation venture no further than impasse, so too are hard realities of prestige, that determine higher education’s pedagogical role and contribution, difficult to expunge. Thus, while *Minerva University* may continue to accrue plaudits for the ‘innovativeness’<sup>5</sup> of its educational model based on skills and problem based experiential learning delivered through a rotational campus model, it’s disruptive threat to the likes of the global higher education leaders, the Harvards and Yales is at likely at best, modest. Arguably, the challenge laid forth by *Minerva*, perhaps as other challenger institutions, under-estimates the resilience of traditional universities. In discussion of the ‘threat’ of ‘new challengers’ to elite universities – the latter as institutions applied to *en masse*, on the very basis of their elitism – we find consensus that the brokenness of higher education and of broad-brush critiques of its pedagogical failure, are massively overstated:

*“Universities still seem to be in business, so they must be doing something right, you know because we haven’t seen the end of them. The sort of preconceptions that all universities are somehow in the dark age and need to be brought forward into the digital future. I think the reality is far more messy than that; far more complex . . . Within any given institution you’re very likely to find whole departments and faculties that are on the cutting edge of using digital for learning teaching and assessment. And you’re going to find you know the exact opposite at the other end of the spectrum.”* (Australian University Director of Digital Education)

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<sup>4</sup> <https://www.diplomaticourier.com/posts/a-tale-of-two-universities>

<sup>5</sup> <https://www.prnewswire.com/news-releases/minerva-university-named-the-most-innovative-university-in-the-world-301565935.html>



The messiness of EdTech take up by universities is also explained by the complexity of integrating multiple systems of technology with a variety of different interfacing devices. A challenge of interoperability for various EdTech systems was recognised as a brake on universities' investment and subsequent use of digital technology:

*"It's a complex situation to really get it right. And the problem is, is that it's not just one system that's trying to be integrated it's multiple for different purposes. One does the learning analytics, one does synchronous, one does asynchronous engagement, one does polling, and these are all different systems."* (Australian University Director of Digital Education)

### **Data Exploitation**

Universities are sites for big data extraction; data that might be adapted as 'actionable intelligence' (Clow 2013). At a process level, big data may help universities to better know and accommodate the demands of their multiple publics. At a strategic level, big data may provide positional gain, market advantage and an opportunity to not only out-manoeuvre their competitors but confirm their credibility to their public financiers and private investors.

In purely pedagogical terms, the mobilisation of big data – specifically learners' digital footprint or 'digital trace' (Breiter and Hepp 2017) – can help universities to better understand their students' learning styles and abilities and therefore tailor provision to specific learner needs and individual demands (Lane and Finsel 2014). 'Learning analytics' and data unique to individual learner profiles and contexts may enable universities to get 'smarter' and become more flexible and adaptive in the development and delivery of 'personalised' content and in optimising learner environments (*cf.* JISC 2017; Perrotta and Williamson 2016; Siemens & Gašević 2012;). Data about learners collected and understood through learning analytics – and visualised through dashboards and apps – is purported to help universities to identify and provide targeted support and interventions, especially for at-risk students and thereby can also help alleviate issues of attrition and maximise retention rates. Learning analytics are also seen to enable adaptive learning; curriculum redesign; predictive learner outcomes; and are even said to boost student motivation and the cohesiveness of learning communities (JISC 2017).

However, providers of learning analytics compete in an unconsolidated marketplace and there is a similar lack of coherence or systemisation in terms of their use within and between institutions – though there are initiatives in Australia, Europe, the US and the UK for enhanced data sharing if not quite a national learning analytics infrastructure. Notwithstanding, the exploitation of 'big data' by universities, may, as Williamson (2017) has described, have a profoundly transformative effect on the future of higher education, where regardless of the negative effects of massification and marketisation, students can enjoy a bespoke educational service that places them at the centre of a self-owned and *self-curated* learning experience with the potential to maximise learner outcomes and labour-market articulation.

In such terms there can be no discounting the commercial value of datafication and educational data science, which beyond the university has already contributed to an EdTech sector. Now, the EdTech sector – often with the vocal support of government<sup>6</sup> - is offering to revolutionise teaching and learning practices *within* universities – and seeking to profit from

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<sup>6</sup> <https://www.gov.uk/government/speeches/science-minister-outlines-the-uks-world-leading-role-in-edtech>

so doing – through learning analytics, online programme management, and artificial intelligence in the form of virtual teaching assistants or AI tutors, straddling the work of human pedagogues. A ‘global education industry’ (Verger *et al.* 2017) that is data-driven and facilitated by digital technologies has emerged and with the potential to capitalise on every market opportunity availed by universities’ portfolio of activity. In addition to the virtual learning platforms – the *Blackboards* and *Moodles* so much a staple of university teaching – digital solutions are afforded to student admissions; alumni relationship management; plagiarism detection – the list goes on (*cf.* Williamson 2021). However, much of the potential of datafication appears in some jurisdictions to be largely untapped. A recent survey by the Chronicle of Higher Education reports that data used in US colleges for the purpose of making strategic decisions is far from optimised, while intra-institutional data sharing is poor<sup>7</sup>.

### **Limited understanding of digital transformation**

Despite the cornucopia of technological applications, knowledge of what it is like to be a teacher in digitalised higher education settings is scarce, while there is even less understanding of how teachers are shaping digital futures of higher education (Teräs *et al.* 2022) or utilising quickly emerging technologies such as large language models (LLMs) like ChatGPT. What is, however, clear is the role of digital technologies in facilitating the datafication not only of students but faculty and in the specific context of performance management of staff. Digital tools may not in such terms be applied as a means of enhancing teaching and learning within universities in so much as intensifying cultures of surveillance, and thus conformity (*cf.* Gourlay 2022). Digitalisation of higher education must then be understood as a new technocratic rationality (Barn 2020; see also Susskind 2020 on ‘future politics’) impacting multiple facets of universities’ organisation including their governance (*cf.* Selwyn 2014) and as a force, therefore, further exacerbating decision-making processes that already lack transparency (Poutanen *et al.* 2020).

Many universities as quasi-market operators and in many countries with decreasing investment from public funds and increasing ambivalence if not antipathy from many Western governments (as state sponsors of HE), are forced to self-sustain through market competitiveness and much like commercial EdTech organisations, must be keen to new market opportunities yet equally responsive to market realities or rather, vulnerabilities. The capacity and inclination for universities to ‘innovate’ remains however, entirely contingent on cost-margins and a tendency to follow ‘best practice’. Few institutions other than those with the capital resources, will ‘innovate’ unless it becomes contingent on their competitiveness. In other words, they will only adapt their provision if not doing so is detrimental to their market position and risks them becoming uncompetitive. There are of course exceptions and outlier universities that ‘innovate’ by for instance licensing digital applications so as to put ‘daylight’ between themselves and their competitors – brand differentiation. These may be institutions that for varying reasons (*e.g.* greater resource, entrepreneurial leadership) may be more agile and/or proactive in response to new market opportunities, and perhaps less wary of brand dilution or confusion that might affect the most prestigious universities as necessarily selective institutions.

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<sup>7</sup> [https://www.chronicle.com/featured/digital-higher-ed/data-gaps-in-higher-education?cid=che\\_ci\\_em\\_mkto\\_1\\_cnt\\_datagap\\_aws\\_23-6&mkt\\_tok=OTMxLUVLQS0yMTgAAAGM6S-JVwGuezwaSvtUKXn6y1UEbtnWADdtHjbj1VI24zkvMG4rG1jsNV7ObkNFI\\_tovP\\_9E1D8-qg0tyWSJyIKCUsJOfqRA2HbrFNn\\_pL0eAzhMD0](https://www.chronicle.com/featured/digital-higher-ed/data-gaps-in-higher-education?cid=che_ci_em_mkto_1_cnt_datagap_aws_23-6&mkt_tok=OTMxLUVLQS0yMTgAAAGM6S-JVwGuezwaSvtUKXn6y1UEbtnWADdtHjbj1VI24zkvMG4rG1jsNV7ObkNFI_tovP_9E1D8-qg0tyWSJyIKCUsJOfqRA2HbrFNn_pL0eAzhMD0)

## Market trends and challenges

In the specific context of universities diversifying their provision and using the experience of the COVID-19 pandemic as a platform from which to move some of their taught offering online, we spy variation. Some institutions for instance in the United Kingdom, like the University of Cambridge, have moved relatively swiftly in identifying how they might platformise aspects of their taught offering and exploit the possibilities of online teaching in expanding a global footprint and attracting an even wider student base. Others, like the University of Leeds (another research elite institution), have recently advertised for a Pro-Vice Chancellor for Digital Transformation to support “*student education, research and innovation, and global lifelong learning*” and identify the need for digital leadership in opening-up and exploiting new market opportunities. In other international settings and prior to the pandemic, technology has been used for the creation of smart campuses<sup>8</sup> and the digitalisation of campus environments (Bonfield *et al.* 2019). A focus on the creation of ‘intelligent campuses’ (Owen 2018) and prioritising the ‘campus user’ (Longmuir 2019), and technology that can be used *inter alia*, to adjust heating and lighting to suit learner activities; make predictions of traffic flow in library and campus cafeterias; and auto-timetable is also apparent and signals how universities are or rather *can* adapt and exploit technologically facilitated efficiencies, though examples remain thin on the ground. A paucity of such examples may attributed to a prevalence of short-termism among university leaders, in turn exacerbated by them ‘being pulled in to many directions and forced to mediate competing interests of different stakeholders’ (Watermeyer *et al.* 2022). As one of our interviewees stated,

*“They [university leaders] have no time, and they have no attention, and they're not thinking long term; they're just not. They're thinking of what's right in front of them they're not thinking of 5, 15, 25 years in the future.”* (UK University Director of Digital Education)

Notwithstanding the handicaps of university leadership, market pressures to appear relevant in the digital milieu are also attributed to investment in digital leadership roles in universities. Such investment was reported by our interviewees on the basis of role transformation at levels of strategic leadership:

*“We're seeing 20% of roles having a purely strategic focus sort of leading into a senior management of digital directors; education directors; digital learning experience; digital student experience. There are lots of job titles, but ultimately those roles are more senior and then have a seat at the top table, which is what we wouldn't have seen 10 years ago. In addition to that, many more institutional roles that used to be purely operational now have a strategic component.”* (UK University Director of Online Learning)

However, a major stumbling block for digital higher education leadership relates to availability, or rather as appears to be the case, lack of available talent and recruitment into universities being compromised by similar demand growth in the private sector:

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<sup>8</sup> Deakin University's SMART Programme is one prominent example: <https://www.deakin.edu.au/about-deakin/news-and-media-releases/news/the-campus-gets-smart>

*“There is currently a huge dearth of qualified candidates. This is a huge growth industry and universities are recruiting for these roles left, right and centre. It's getting difficult to recruit to the roles. There aren't enough people out there with the, with the skill set. But it's not just the universities either you know. Learning and development roles have exploded in the private sector as well.”* (UK Learning Technology Expert)

While new, ostensibly, more entrepreneurial universities have arguably taken a lead in digitalising their offering and there exist, as we have already showcased, many private non-profit and entirely online ‘universities’ in operation, many of the big, long-established names are now entering the field. At a postgraduate level, this is not at all surprising. Estimates put approximately 40% of all Masters level provision in the US to be online. The effect of established names entering the online higher education marketplace is significant. Where the likes of MIT, Harvard, Cambridge and other global university elites are present, the stigma that has been historically associated with online higher education would logically wane. This destigmatisation is important both in messaging to future students and employers the credibility of these credentials. What’s more, destigmatisation of online higher education by the most prestigious universities has a ripple effect in the pond of institutional imitation, where ‘proof-of-concept’ provides a pathway for other institutions – those in the majority middle-tier of universities – to follow suit. An expansion of online provision into the traditional in-person delivery format can be seen, therefore, as affecting a new model for teaching and learning within universities. However, for online higher education to gain real credibility, resourcing universities’ digitalisation needs to significantly step up and exceed cosmetic or tokenistic forms of investment. Universities need to surpass “dumping iPads into conventional classrooms without changing teaching or assessment methods and putting traditional lecture courses online” (Davidson 2017: 9).

While there has been a labour-market trend, stimulated no doubt by the pandemic, of increased hiring of learning technologists into universities, there is equally evidence of massive work-intensification (Watermeyer *et al.* 2021) and attrition (Watermeyer *et al.* forthcoming) of teaching staff which is seemingly unreflected in universities’ approaches to digitalisation yet as one of our interviewees stressed, integral to its success:

*“Digital is generally added on to their [academics] workload and nothing is taken away . . . I've said until I'm blue in the face, with everybody who I can get in front of including the head of the institution, that you need to build 300 hours into an academic's workload in order for them to create one online module. But they don't actually take 300 hours of other stuff out of that academic's work, which is what needs to happen if you're going to actually bring about a true transformation of an on-campus course.”* (Australian University Director of Digital Education)

The likelihood is that only those universities that are most resource rich will be able to adequately cater for such digital adaption. For instance, universities able to offer hybridised taught delivery, will be those able to afford and willing to invest not only in “sophisticated cameras, microphones, and monitors” but “teams who help train faculty and serve as learning designers and classroom technology professionals” (Maloney and Kim 2021: 62). Those universities with the biggest global brand and international presence will likely be those most able to finance and sustain online capability – and also perhaps through EdTech intermediaries establish new digital partnerships with industry and business. The same will be

those able to best realise a hybrid/work-integrated/digital experiential model. Of course, this will come at a cost – to universities, to students (the low-cost options may not be so applicable here) and employers. Chances are that online education will follow the same sorts of stratification evident within offline settings. Online education from the most prestigious institutions may have some cost-benefit (in comparison at least to the standard on-campus experience) but may equally be out-of-reach financially for many students, who may be forced to opt for cheaper, lower quality options, such as those provided by so called ‘affordable’ online providers (cf. Cottom 2016).

Such ‘affordable’ and easy-to-access (if low prestige) US providers, represent for many less affluent individuals, the only viable pathway to higher education. Consider, for instance that the ‘anemic acceptance rates’ of highly prestigious and ‘legacy preference’ private universities such as Harvard is as low as 3.4% (Laporte 2022) while the internationally recognised public University of California, Berkeley, has a reported 16%<sup>9</sup> acceptance rate. The online low-cost Southern New Hampshire University (SNHU) by comparison has a reported 88% acceptance rate. Such differentials are also observed in terms of student faculty ratio, at SNHU this is reported to be 21:1 (at Western Governors the margin is 42:1) compared to a reported 5:1 at Harvard. Graduation rates similarly differ. At SNHU graduate rates (over a four-year period) are reported to stand at 42%. At Harvard this is double at 84%. In terms of average annual salary (six years post-graduation), students of SNHU may anticipate remuneration of \$50,200. For graduates of Harvard the figure is almost tripled at \$139,100. While a direct comparison between a world elite university and an online higher education provider is at best indicative, the comparison in such terms, reveals that in the US (as in other countries like the UK), accessibility is poorly linked to return on investment.

Job opportunities may likely in this scenario be just as much dictated to by the relative prestige of the graduating institution, less the quality of the online learning experience. As one of our interviewees put it:

*“I don't think employers care about if the student got a residential or an online education, I don't think anyone cares about that anymore. They care about the institution, the brand. Brand is mattering more than ever.”* (US Digital Education Expert)

Consequently, it may transpire that the increased platformisation of higher education will increase – but not widen – participation, before platformisation becomes highly stratified and dictated to by the prestige imperative of higher education and will ultimately further polarise the market into high cost/high value hybrid credentialing and low-cost/low value digital-only credentialing. Hybridisation as opposed to exclusive platformisation of higher education, that is education accessed entirely remotely and via digital means, will be the key distinguisher of university types, reserved we would speculate for high prestige institutions, who will seek the ongoing commercial benefits of open physical campuses and the additional revenue – and prestige value – generated through their digital offerings. As such, universities will be provided another toolkit for the acquisition of positional goods.

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<sup>9</sup> <https://www.cappex.com>

For elite universities, their foray into the realm of alternative credentials, may, as one of our interviewees argued, be almost exclusively driven by an aspiration of market dominance:

*“Elite schools have traditionally not wanted to do skills-based kind of education. But employers want those skills. That’s where the market is and we’re doing some of that. And we are doing that because that’s where the money is, right? Like again the reason that these alternative credentials are growing is it’s a revenue play by the Schools. In all of these trends there’s almost nothing I’m seeing that mitigates against increasing concentration of wealth, increasing stratification, the calcification of the caste system.”* (US Director of Digital Education)

The marketisation effects of universities, specific to accusations of pedagogical poverty, may translate just as much to an online context and repeat what unschooling proselytiser, Dale Stephens (2013: 9), depicts as a situation of universities in thrall to profit over people:

*“. . . if you want to learn in college, you’re going to have to fight. The odds are against you: The professors are researching, the students are partying, and the administrators are building new state-of-the-art gyms every few months. None of these people has a direct incentive to help you learn . . . Universities do not exist to train you for the real world: they exist to make money”.*

If digitalisation represents a new frontier for the marketisation of higher education, there is likely limited chance that it will, despite its liberatory and equalising potential, level a playing field and widen opportunities for less advantaged students where it is co-opted precisely for universities’ capital accumulation. Concerns of a ‘digital divide’ (van Dijk 2020) and ‘digital disconnect’ (Helsper 2021) may thus escalate as systemic inequalities, already hardwired into the higher education system, take deeper root. Where quality of digital provision widens according to the relative wealth of infrastructure and pedagogical expertise within universities, the benefits of online learning will vary (*cf.* Maloney and Kim 2021). It may be only a select few who ultimately experience a fully customised and experientially immersive digital education. Moreover, even assuming that less affluent students have means of digital access they may not have space nor time to benefit from digital learning, regardless of its quality. Where they do, their digital learning experience may be hampered by the resource deprivations of the kinds of universities that serve the most underprivileged student populations.

### **The EdTech contribution: A new value proposition for higher education**

As a recent article<sup>10</sup> by Nick Hillman, Director of the UK Higher Education Policy Institute, points out, it is incredibly hard to predict educational futures, at least with any great confidence or accuracy. Forecasts made amidst crisis are, as the pandemic has revealed, even more prone to error and suffer the potential incursion of either unconscious bias – outlook informed by mindset – or the propaganda of profiteers. Prophecies of post-pandemic devastation have in many cases failed to transpire. There has for instance, as Hillman observes, been no crash in university admissions in the UK and students have not quite abandoned halls for their homes (*cf.* Jones 2020).

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<sup>10</sup> <https://www.hepi.ac.uk/2022/01/18/five-predictions-about-covid-and-education-that-turned-out-to-be-wrong/>

Selwyn suggests three ‘impossible’ suggestions for the future of education and technology, the first being ‘extensive and intensive state involvement’ and therefore ‘public institutions that are digitally competent, confident and forward looking’ (2021: 150). The second is ‘curtailing the activities of commercial non-profits . . . mandating the ethical ‘selling’ of technology to education’ and ensuring ‘that corporate interests act in ways that genuinely serve education – not the other way around’ (2021: 152). The third, to ‘reconfigure the topic of technology and education as a site of controversy’ (2021: 154) and thus animation of an otherwise apathetic public response to such universal concern and the transition of public stakeholders from *objects* of technological change to *subjects*.

We propose a fourth suggestion for the future of education and technology. If, as we suspect and have already alluded, the future of online higher education is as offline higher education, rigidly stratified, then the most prestigious and highest globally ranked universities will carry a significant weight of social responsibility. They will need to ensure that their taught digital and/or hybridised programmes are not only richly experiential yet theoretically committed, industry connected and scholarly led, but also not off-limits to the vast majority. If the major global universities ultimately become the titans of hybridised learning – the latter we anticipate for most students being the most attractive offering, pedagogically effective and socially responsive – and there is an overall contraction of the higher education sector as less prestigious and lower ranked institutions cease to be competitive, then they will as ‘public’ institutions need to work more closely and more intimately with a range of other education providers. They will need to embrace the widest possible community of schools, community colleges and community organisations – and thus also the widest possible demographic – and not just preferred ‘feeder’ institutions. They will need in other words to mobilise the potential of digital connectivity to higher education in ways that embraces as Deem (2019) puts it, ‘virtue ethics’ and transcend deference to producer capture.

The promise of flexible, customised, and personalised higher education by digital means, might not be reserved for the most advantaged for whom the net impact will be far less than their less advantaged counterparts. The point we make here is that the benefits of educational digitalisation will be of far greater value to those whose life circumstances are inflexible and whose relationship with, and participation within formal education, has been sub-optimal and if anything, impersonal. These are the same for whom accordingly, the prospect of meaningful employment, access to the best jobs and eligibility for future jobs, as well as improved life circumstances are typically enervated by the impoverishment of their educational experiences and the quality (and quantity) of their credential accumulation.

If the most prestigious or what Grant (2021) calls ‘new power universities’ adhere to virtue ethics in their pedagogical incorporation of digitalisation, this should also mean an active contestation of their role as defined by neoliberal policy, so that the aim of universities greatly exceeds a common reductive definition of turning out ‘people and ideas capable of making money’ (Collini 2012: 154). An adherence to virtue ethics, should also mean that new power universities are not only more socially connected through digitalisation but socially *protective*. This means that in being more readily available to the widest demographic that they prevent the exploitation of less advantaged yet not less educationally aspirant individuals whose choice has been historically limited to low-cost and low-quality forms of higher education, of which there is currently a morally unjustifiable prevalence. The new power universities may do this by force of market. In such terms they may also break from the mould of handmaiden

to labour markets to become co-producers of labour markets and architects of future skills. However, all of this depends on the willingness of leading universities – or rather the leaders of leading universities – to commit themselves not to the preparation of students as ‘job ready’ but ‘world ready’ (Grant 2021: 40) and we would add ‘world resilient’. By this we mean in essence that higher education is intended and embraced not just for the purpose of getting a ‘good job’ – a qualification of employment almost impossible to pin down and which is equally, impossibly subjective – but that it provides for various formative periods of life investments (cognitive, social, emotional growth *etc.*) that sustains purposeful citizenship, which includes yet is not overwhelmed by economic rationalisations.

Yet what is the prospect of realising this potential vision for higher education? To what extent can universities achieve this and to what extent might motivation for achieving this vision vary across international contexts? How, for instance, are different HE systems positioning themselves in a post-COVID context? Who are the ancillary players that might make universities not only more meaningful and relevant in the context of societal (and crucially of course jobs) transformation and in making students ‘world ready and resilient’ but in making world readiness an outcome available on a mass scale? We consider two examples of EdTech intermediaries whose business is focused on helping universities achieve this vision, specifically by attempting to mediate the worlds of education and employment.

#### *Riipen*

Riipen, a spin-out of Victoria University, focuses, in the words of its CEO on “*taking what we learned in the classroom and applying it to the real world . . . real world applications, reflecting experience brought back into the classroom*”. It takes its roots in a strong co-operative (co-op) education movement in Canada, which follows the core idea of work-integrated learning and students benefitting both from classroom pedagogy and work-place learning. Despite significant central funding in Canada, Riipen was formed as a response to many students remaining without access to practical work experience and as a means to make available to them project-based learning and learning through applied research projects. Riipen also focuses specifically on SMEs who lack infrastructure for traditional internship programmes and/or are without campus recruitment teams or a big employer brand. It equally targets students on small and/or rural campuses who typically struggle to find internships and are forced to rely on family networks. By developing flexible and customisable projects, Riipen seeks to build symmetry between employers’ business needs and the acquisition of university students’ work-based skills and knowledge. While traditional co-ops are difficult to scale, Riipen seeks to establish an ‘open shared collaborative ecosystem’; an intellectual commons or Wikipedia for work-integrated learning based upon a suite of digital artefacts including for instance, video chat and online project management tools *etc.* In the words of its research director, Riipen “*enables universities to go through a process of change management*”.

#### *Forage*

Forage is another company that focuses on virtual work experience. Different to Riipen, however, Forage targets not SMEs but large global companies like JP Morgan, Goldman Sachs and Microsoft, among others with capacity to co-develop open-access online training courses as a means for students to sample work life and road-test the kinds of jobs such companies offer. Forage argues that its programmes avoid ‘information asymmetry’, reduce job attrition and thus aid companies’ talent retention. It claims to work with 350 universities mainly in the United States but also in Europe and the Asia Pacific region and advertises



enrolment of over 1.5 million students. Of these, it seeks to cater for individuals on the fringe of education/working life, for instance parents who have taken a career-break to look after children or military personnel transitioning back to civilian life. Forage's business model is based not on remuneration from university partnerships but instead companies who pay an annual subscription fee to post courses on its website. There is no course charge for students. Forage claims to work with Schools with disproportionately high numbers of students from underrepresented backgrounds and underserved communities. As their CEO told us:

*"We're here to help students that typically don't even get a look-in . . . give them the skills, the confidence to see a pathway into these organisations and to get those students in front of those partner organisations and say, "Hey look at these candidates... maybe you should like look outside of those traditional pools of talent"."*

The USP of both Forage and Riipen is that of opening doors and providing enrichment for those without or with lesser access – utilising digital technology for social mobility. Their products are also about building improved relational fluency between employers and universities, enabling both to benefit in the sense of talent recruitment and employability rates. Of course, there is also an argument of the cost-savings won by individuals being able to make informed choices about their career decisions. The role of Forage and Riipen in opening students' eyes to the world of work and of being able to occupational role-play also reveals the inherently social aspect of work, and employment being not only the process of matched skills and competencies, but personalities and the importance of social fit.

University leadership increasingly view work integrated learning as a priority for student recruitment, especially where the higher education value proposition is set against a backdrop of spiralling student debt, graduate unemployment and underemployment. For universities, work integrated learning may form a competitive part of their offering. However, as many of our interviewees stated, despite a prevalence of discussion within universities, little internal change has been affected:

*"No matter how much we've actually tried to talk about the truly learner-oriented approach, taking the employers and the workplaces as a very integral part of thinking, that has not happened."* (Higher Education Director, Finland)

EdTech start-ups like Riipen and Forage offer a corrective in the realm of digitally mediated higher education and are proposed to provide university students with *"experiences you don't get in your own backyard"*. EdTech in such context services a change management role in universities. It may be sold as 'energising' educators; making sure through a feedback-loop that the curriculum they teach is never out-of-date; and they themselves profit from a wider professional network. In the marketised context, as a main selling point for universities, faculty are thus obliged to engage with work-integrated learning as part of their pedagogical approach. In such terms, work-integrated learning transitions from the jurisdiction of universities' career services and co-curricular activities to become an embedded part of universities' core curriculum. Yet, such transition represents an additional work burden for already overstretched faculty, already documented as the additional pressures of teachers using digital tools (cf. Mertala 2020; Grimaldi and Ball 2021) and may prove a stretch too far for ever growing numbers of casualised adjunct faculty and in the context of a dual-labour

market comprising a minority of academics working in protected elite settings and a majority class of precarious workers (*cf.* OECD 2021).

Future proofing higher education in the context of making students ‘world ready and resilient’ or ‘lifelong workers’ is also envisaged through a model of change in universities operated in contexts like Georgetown University in the United States and its Red House innovation. The Red House is intended to breakdown a ‘one-size fits all approach’ to university study by getting students to work across multiple fields, and by expanding the classroom across every department and professional school. The Red House moves beyond a one-size fits all approach. Instead, it promotes learning across campus in multiple fields, going beyond campus borders: “the ‘classroom’ must expand to include every department and professional school, plus K-12 schools, policy think tanks, archives and data repositories, community organisations, video games, and playgrounds” (Davidson 2017: 232)

The COVID-19 pandemic and other recent major global events such as the *Black Lives Matter* movement have further exposed much of these already glaring inequalities and yet offer a potentially crucial moment of reset and recalibration; an opportunity to move beyond the historical tokenism of many efforts for improved inclusivity, equality and diversity within university learning communities and to embrace a new value proposition for higher education. However, it may be that this opportunity is missed if universities and their so-called challengers continue to be blindsided by the positional gains of educational commoditisation.

COVID-19 would seem to represent an unrivalled opportunity to shake up the higher education sector and in such a way as to not only increase market competition among providers and thus as government might desire, improve standards – no wonder perhaps then that governments’ economic impetus into universities has been markedly shallow – but firmly embed a process of digital conversion. A consideration of recent capital investment in EdTech confirms such a view.

For the first financial quarter of 2020, the commercial EdTech sector accumulated \$3bn in global venture capital, the equivalent of 10% of the previous decade’s total investment in the sector; an upturn attributable to the COVID-19 crisis and estimations of 1.5 billion learners deprived of physical access to schools, colleges and universities (UNESCO 2020). In such terms EdTech companies moved rapidly to showcase their offerings to a wide audience and via free access; thus also promoting their altruistic credentials. Venture capital investment further increased in 2021, up from a total year investment of \$16.1B in 2020 to \$20.8B (HolonIQ 2022). However, projections of total year investment for 2022 at \$17.4B reveal a downturn and thus the fluctuating fortunes of EdTech as a market commodity in a world where the future trajectory of education remains persistently ambiguous.

The opportunities of EdTech for universities are advertised in terms of enhanced connectivity and cyber-security, that extend beyond most institutions’ existing capacity. Secure, stable and reliable connectivity<sup>11</sup> is promoted as a now essential component of taught offerings and universities’ capacity to provide flexible, customisable and personalisable solutions complementing the demands and expectations of a diversified and internationalised student market, in a mass era of global higher education provision. Superior wireless connectivity is

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<sup>11</sup> See for instance: <http://khipu.campus-networks.com>

considered especially important where students' access to and use of learning content and participation within learning communities is increasingly made 'off-campus' and asynchronously in a borderless and detemporalised context. The 'lecture theatre' may be now scattered across global time-zones and interfaced by large numbers of students through a variety of mobile technologies. In the UK, for instance, 80% of students are shown to access taught material through smartphone devices (JISC 2021)

The pandemic has certainly boosted market demand and stimulated the emergence of a host of new market providers. However, the flooding of the tertiary market in countries like the US has also resulted in an imbroglia of nearly one million available education credentials, including degrees, badges, certificates, licenses etc., leaving many employers bewildered (Rutgers EERC) and uncertain in determining the credibility of credentials from unrecognised providers littering job applicants' resumes.

The proliferation of various forms of non-degree credentials, are seen by some as another example of an evolving gig economy and platform capitalism, whilst others believe that micro-credentials are central to lifelong and life-wide learning, offering better integration between formal, informal, and non-formal learning. This could entail a shift from transactional to relational engagements, where universities could position themselves in a connected learning ecosystem and become a central node in challenge-based research, innovation and learning for the common good.

It is often argued that the evolution of digital badges, micro-credentials and certifications provides endless new opportunities for flexible and personalised lifelong learning journeys. How this will play out is, however, uncertain. So far, evolution in the provision of lifelong learning has primarily occurred as innovations in delivery models, as exemplified by the current format of certifications and micro-credentials. We are yet to see any innovations in how learning is conceived and designed and for what purposes.

For universities, there is need to better acknowledge the impact of platformisation or hybridisation of teaching on their staff and students and appropriately scaffold the hybridised classroom. There is need to widen the aperture of awareness and confront what Neem (2019) identifies as universities being pulled in far too many directions. There is work also to be done by universities as relates to attrition and non-completion of their programmes. In reassessing their value proposition and value chain, universities need to take a hard look at what they do and do best and what help they need to do better. All OECD countries have over the course of the last four decades implemented new public management strategies with the intention of improving public sector performance yet with the effect of making public education – alongside other public sector organisations – increasingly reliant on corporations for the delivery of public services (Bleiklie 2018).

### **The role of generative artificial intelligence (AI)**

While forecasts of the impact of generative AI circulate in abundance the release of the large language model, ChatGPT<sup>12</sup> in late 2022 has invoked a global media frenzy, and as tends to accompany the arrival of disruptive technologies, moral panic, particularly as relates to

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<sup>12</sup> Also purported to have unprecedented user-growth: <https://www.zdnet.com/article/chatgpt-just-became-the-fastest-growing-app-of-all-time/>

displacement effects. ChatGPT and other AI chatbots that have quickly followed, such as Google's 'Bard' and Meta's 'LLaMA', are technologies designed to imitate and substitute human content creation and are as such labour-savers. ChatGPT can perform tasks of writing letters, essays, code, even film scripts and music scores; albeit with highly variable quality and as restricted to algorithmic formulas that make textual predictions based on vast quantities of data-scraping. The potential of its application to knowledge production and acquisition appears on the face of it considerable and the implication of its rapid user growth is profound to educational communities (*cf.* Dwivedi *et al.* 2023).

While generative AI like ChatGPT is labour-saving, it may also be educationally impoverishing where it incentivises learners to bypass the burden of learning and 'cheat'<sup>13</sup> by leveraging natural language processing in the generation of assessed work; a trend for which there is significant reporting (Cassidy 2023). However, some educators have been quick to identify the weaknesses of AI's content generation and are exploiting such existing deficiency for the purpose of enriching the critical competencies of their learners<sup>14</sup>. AI or 'AIEd' (Baker, Smith and Anissa 2019) in such terms may be approached far less for its potential in automating learning as enhancing learning and therefore as an additive rather than substitutive technology. This is a perspective in part shared by technologists in the international higher education space, who have commented to us that the future model of HE provision needs to be 'human centered and AI accelerated' and who argue that AI is something not to be afraid of as to be owned<sup>15</sup>: 'it's about business re-engineering and reorganising to future-proof'. A vision of future-proofing by *owning* AI is in such terms rationalised as a collaboration that involves the synergising of the best bits of human and AI capabilities. Thus, for instance, an AI tutor might provide a student with easily accessible, highly detailed and personalised information that is typically less easily or efficiently retrieved from a time-starved faculty member. The student would also however be provided an exit opportunity for direct, and potentially, higher value, contact with a faculty member. In such a scenario the faculty member would,

*“ . . . coordinate and manage and oversee the kind of full body of content that's being produced by the AI; continues to train and tweak it, but also is there to support the individual when they need it.”* (Australian Learning Technology Expert)

The AI would ostensibly save faculty from the bureaucratic burden commonly experienced in universities – and which is attributed to significant HE staff attrition and brain drain (*cf.* Watermeyer *et al.* 2023) – and provide a means of reinvesting and privileging the pedagogical interface between student and human tutor organised around the latter's specialist expertise<sup>16</sup>. AIEd might therefore be used to 'spend more time on developing personal relationships with students, and less time pushing paper'. Applying AI technologies in such an integrative way is however an expensive and labour-intensive proposition, requiring that faculty be provided both time and resource to upskill; outlay universities may find hard to countenance despite the prospect of significant productivity gains. Paradoxically, it might transpire that while integrative

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<sup>13</sup> 'Cheating' – at least according to conventional understandings of individual learning

<sup>14</sup> <https://www.theguardian.com/technology/2023/may/18/ai-cheating-teaching-chatgpt-students-college-university>

<sup>15</sup> Such a view sees educators as supervisors/orchestrators of AIEd tools (*cf.* Luckin R, Holmes W, Griffiths M, Forcier LB. (2016) *Intelligence Unleashed: An argument for AI in Education*. Pearson Education).

<sup>16</sup> Reversing a contemporary trend of academics' deprofessionalisation through extensive institutional bureaucratization.

AIEd may enable enhanced productivity, it may also lead to alternative tech-facilitated forms of work intensification (less work alleviation) and a further diversification of work-demands and thus strain on academic faculty and their relationships with students. Analogously, an excessive valorisation of the affordances of AIEd would seem to neglect the social conditions in which learning and teaching occurs, and that not less but *more* human resource is necessary to fulfilling the integrative affordances of AI. On another note, the success of integrative AIEd also demands interoperability between AI apps and existing digital architecture – principally an institution’s Learning Management System – with opinion that the latter will become increasingly obsolete<sup>17</sup>.

Many HE technologists we spoke with, felt that faculty’s ownership and ability to exploit AI in integrative ways was limited by the prevalence of top-down control and inflexibility of work management protocols in universities. A long-term business analysis of the cost affordances of AI integration, where if the AI ‘is trained really well, you can do things at scale with a much leaner team’ was felt to be essential for universities to be ‘not only much more productive but also do way more interesting work’. Correspondingly, the potential of AIEd in terms of cost and resource affordances might also culminate in higher education leaders (and policy makers) justifying AI tutors as human substitutes, particularly in the context of online educational delivery, and in country settings like the US where the public higher education sector is experiencing decline in enrolment rates (and public funding) and high attrition rates (Rosensweig 2023). However, as is the case in the UK, a perception among policy-makers of the superiority of ‘in-person’ education, may arrest the advance of AI tutors much in the same way as it has more broadly disincentivised pedagogical innovation within universities. As one of our interviewees put it:

*“I think the policy context really does not help in the UK. I think the policy angle is very strong. You know, return to the office, return to the classroom, return to teaching in person. I think universities are between a rock and a hard place. On the one hand, they want to be cutting edge and competing on the other hand, policy says, face to face contact hours are essential and I think that is why it’s patchy and stopping people buying into more innovative technologies.”* (UK University Director of Digital Education)

Nevertheless, it may transpire that the pedagogical advantages of AIEd integration may be lost to economic necessity and the further adjunctification<sup>18</sup> of faculty in public universities. Contact with human tutors – and integrated AIEd approaches – may become the preserve of elite universities able to accommodate the expense of human labour and able to furnish their students with forms of AIEd *facilitated* (not substitutive) pedagogy.

Purposeful integration of AIEd technologies that might significantly ameliorate the learning experience, particularly when delivered and experienced in online formats, requires institutional vision and bravery in committing to a long-term vision of collaborative AI and its embedding as a strategic priority. As one Australian higher education technologist told us:

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<sup>17</sup> Interoperability also raises questions as to the extent to which institutions’ digital architecture become even further more dominated by a few powerful core tech providers.

<sup>18</sup> Adjunctification refers to a trend of employing university lecturers on casual and insecure contracts – as ‘adjunct’ professors

*“You have to come in at a strategic level and embed it, and then everything should build around that. What we don't want to do is just kind of have these little pockets of innovation.”*

For some institutions, an investment in AI and other digital technologies is also a question of relevance and being able (or willing) to rationalise it as part of a business case. For many elite universities, digital and AI technologies are not part, nor need to be a part of their core offering. EdTech is not especially relevant to their business model of selective, in-person provision. Where investment in technology is made it is not out of a pedagogical commitment or aspiration to provide cutting-edge teaching and learning environments<sup>19</sup> but is instead about institutional marketing and a desire to appear cutting edge to external audiences:

*“We need to be living in the 21st century. Every other industry is moving towards incorporating digital practices. We need to do that also if we don't do that if we just wall ourselves off. We could do that. We'd probably be fine. We just wouldn't be very relevant, no one would look to elite institutions as models of anything.”* (US Director of Digital Education)

Significant variation of wealth and thus resource capacity and risk tolerance within and across higher education sectors<sup>20</sup> is recognised to impact the extent AIED integration might occur. However, given that a lot of 'AI technology is [currently] free', it would seem that a financial commitment to maximising the value gain of AI investment would be primarily less about technological and instead intellectual resourcing. In one globally leading UK institution where we interviewed, we found critical mass of senior scholars supporting investment in digital capabilities and crucially human resource:

*“We have a lot more freedom to kind of lean into these things. And this is because we have a lot of leaders in this space. You know, we've been teaching AI and entrepreneurship as a module for a while. We have a lot of professors of practice who are experts at this type of thing . . . You need different minds in this, to build a strategy. It can't come from a single team or a single individual.”* (UK Director of Digital Education)

That AI is in many instances currently, cost-free, is a major part of an emerging digital political economy where technological producers are able to exert significant if tacit influence over educational futures<sup>21</sup> and thus arguably by extension workforce development, where the speed of current innovation is outpacing, indeed eclipsing regulatory frameworks. The speed of AI innovation and the potential of its disruptive power has even caused some major names within the tech world to call for government intervention and a pause on further penetration of

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<sup>19</sup> Though given the inferior status afforded to teaching in most (research) elite institutions, investment in such terms is anyway largely questionable.

<sup>20</sup> Sector level capabilities especially among mass public higher education providers for maximising the use-potential of AI for learners will also depend upon government investment in adequate resourcing national level digital infrastructures and policy commitment to digital levelling-up ending digital poverty and ensuring all HE entrants and potential beneficiaries are provided opportunities to benefit from AI.

<sup>21</sup> This has already been witnessed in the context of philanthropic capitalism enacted by Ed-Tech and Big Tech providers during the pandemic who initially provided some of their digital resources on a pro-bono basis but as part of a longer-term strategy to embed their products in the educational marketplace and at future cost.

AI technologies into the public sphere<sup>22</sup>. However, not all are convinced that Big Tech will come to break the monopoly of higher education provision enjoyed by universities. Some, for instance, see augmented provision by non-university entities as being job specific:

*“People who want to buy their education will buy their education from Google if they think it's going to get them a job at Google.”* (Australian Digital Education Expert)

Others consider that universities provide a more holistic value proposition to industry specific training but that they need to become more ‘assertive’ in promoting their contribution in such terms, for fear of else ceding ground:

*“No one can really convince me that universities can't teach a good amount of that better . . . We will have to work in partnership with industry in order to do it, but we need to be a little bit more assertive in that space now or we'll lose a lot of it.”* (UK Director of Digital Education)

The bigger message about AI is perhaps ultimately about how it might accelerate emergent and/or future-necessary transformations of higher education that complement requirements not only for its sustainability and continued relevance but in maximising its social and economic function. For instance, while the application of AI by students for assessment purposes forms a major part of current hysteria as relates to academic integrity, plagiarism and ultimately false credentialism<sup>23</sup>, it might also be considered as a trigger for assessment reform, benefitting learning journeys/outcomes, education/work articulation, job preparedness and the capacity of learners for continuous education and training. One of our UK interviewees for instance commented that,

*“It challenges the way that we're assessing. It's such early days, but a lot of our faculty are already using it in their assignments. For our program on AI and entrepreneurship they [students] essentially have to work with their chosen generative AI system to build business cases . . . They [tutors] can evaluate structure, coherence, language use and provide more kind of objective grading. So, it's also on the grading side of things. It can facilitate peer reviews. It can eradicate bias in your assessment. So, I think there's ways to kind of incrementally improve the way we do things.”*

However, there may be no escaping the reputational damage inflicted on university qualifications when viewed by employers, among others, as having been compromised and devalued by students’ indiscriminatory use of AI. While brand management and market competitiveness will likely drive most universities response to the challenge of AI, panic-responding to its disruptive potential through censure and prohibition are likely to be counterproductive. Banning students from using AI within their learning would seem a retrograde step<sup>24</sup> in a world where an ability to work with and harness rapidly improving AI will increasingly become an everyday necessity; not least given ‘it is being tested inside law firms,

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<sup>22</sup> Such public pronouncements may quite feasibly also be orchestrated on the basis of stealth marketing and tech-capitalists drawing escalating attention to their products rather than as appeals to the public good.

<sup>23</sup> Where AI is used in fulfilment of assessment obligations and thus produces a false record of learner competency and capability

<sup>24</sup> And potentially profligate where the AI becomes more sophisticated and able to evade detection

management consultancies, news publishers, financial institutions, governments and schools’.

Universities’ obligation to their students in preparing and sustaining their labour-market relevance therefore demands that they embrace and not embargo AI. Yet their embrace needs to be critical and cautious and guided by the guardrails of techno-ethics; itself in need of rapid updating. AI needs to be understood as an invention motivated not by social good<sup>25</sup> but financial benefit and as underpinned by a ‘black box’ of data plagued with bias, discriminatory potential and ample chance for causing social harm. Similarly, while generative AI like ChatGPT can provide rapid evidence collection and synthesis it is laden with high risk of error and misinformation. A concern of a concentration of data sovereignty by tech giants was also highlighted by one of our experts:

*“What I worry about most is the concentrated power of the 4 or 5 very large tech companies that have the ability to both gather and Hoover up enough data, surveillance data, to train these models. It’s very clear that these companies are going to do whatever they can to keep out any meaningful government regulation and or oversight. They’re going to try to come together and set the rules.”* (US EdTech Expert)

So too is it a concern that the current and emerging impacts of AI use for higher education, and the way with which AI is being used by students, is largely unknown:

*“We don’t know if they’re [students] using it in ways that we think would be good as educators, or if they’re using it just to kind of cheat. It could be both or other ways.”* (UK Director of Digital Education)

Notwithstanding such risks, building ‘computational literacy’ (cf. Wolfram 2020) gained through mastery of generative AI, is viewed by tech advocates and those that seek overhaul of conventional educational approaches – particularly standardised testing models – as a means by which to liberate learners (and workers) from the tedium of mundane tasks, allowing them to more generously focus on the cultivation and refinement of non-replaceable (as yet at least) higher order skills, such as creativity and critical thinking<sup>26</sup> viewed as indispensable to work longevity. Computational literacy therefore poses an important question, raised by one of our expert interviewees, not only about ‘what are the skills of the future but what are the skills of the past’. However, delegation of foundational tasks to AI is also seen to risk lower-order skill competencies, meaning learners may become less self-reliant and increasingly dependent on AI for basic tasks<sup>27</sup>. The risks of (lower order) deskilling may multiply where AI tools change from being cost-free to tariff-based and accordingly become unaffordable and inaccessible, consequently exacerbating the effects of digital inequality on society’s most vulnerable (and educationally deprived). However, the transformational potential of AI for education, as compared to other technological game-changers like virtual and augmented reality, seems a much firmer bet, if only on the basis of finance. As one of our interviewees put it:

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<sup>25</sup> And AIEd much like other forms of edtech is not well informed by pedagogy, see for instance: [https://media.nesta.org.uk/documents/Future\\_of\\_AI\\_and\\_education\\_v5\\_WEB.pdf](https://media.nesta.org.uk/documents/Future_of_AI_and_education_v5_WEB.pdf)

<sup>26</sup> This was seen as a generational step-change in skills-values as one of our interviewees reflected: *We’re really going to be widening the gap between skills that our parents found valuable and useful, and the ones that you young people are going to find valuable and useful.*

<sup>27</sup> <https://www.ft.com/content/47fd20c6-240d-4ffa-a0de-70717712ed1c>



*“There was a lot of hype about this [VR/AR] last year, and then it pretty much died a death. I think people are using it incrementally, but only a few people are really still thinking, “This is going to transform the way that we teach”. And I think a lot of that is because the hardware was always going to be unwieldy. The money, upkeep, the physical space that's required to deliver classes. You can build it as a complementary part of your curriculum but it shouldn't be replaced. It's not really going to replace or transform anything.” (Australian University Director of Digital Education)*

The economics of AI in terms of labour and resource saving can also not be overlooked. There is for instance immediate danger for those in the EdTech start-up sector who fail to pivot their products and services in line with AI advances. These start-ups are likely to find themselves absorbed by the big tech players, a result which would represent further concentration of EdTech and AIED power. In the university setting, AIED is seen to spell doom for learning management systems and so too public-private partnerships such as OPMs:

*“On a content creation point, you're going to invest in people in your own department. But you're also now going to complement that with what the AI systems can do for you and you're more likely to spend money on these systems than you are on a partnership.” (UK University Director of Digital Education)*

At the level of learning design and organisation, the argument of AIED advancement is also that a prioritising of global skills requires movement away from specific skills/knowledge-based curricula and a recommitting to a broader 'liberal arts education' that will better service students' capacity as architects and occupants of job reinvention and their necessary commitment to continuous learning:

*“So, when I think about AI and what we should be doing in the world of work, I kind of come back to, “Well, this is where a liberal arts education really shows its value”. Folks who are more broadly educated will be in the best position to use these new tools to reinvent work. So, I think this is a good time to pull back on this skills-based education that we've been so emphasising to really think, we're going to train people for their first job and really think, okay, with this shifting technology, we have to train our students for a lifetime of working, and that means a lifetime of learning.” (Australian University Director of Digital Education)*

Universities' embrace of a 'lifetime of learning' also however requires, as one of our interviewees described it that universities “maintain the social contract that they've established with their graduates” and make provision for continuous re-entry based not just on the philanthropy of alumni, but individuals that will continue to make use of universities' educational provision; provision, however, it was felt, that will inevitably change due to economic pressures, technological possibilities, and changes in learner preferences and needs:

*“Campus-based activities will shrink in size. We will have hundred seat ticketed lectures where students will come along you know, on a sort of rotational ticket basis or first interest, best dressed or something, and the other 400 students will be absorbing it remotely. We've been uplifting facilities to facilitate hybrid learning within*

*classrooms quite vigorously over the last couple years. That will just accelerate. And I think our footprints will become smaller and the on-campus experience will become more boutique.”* (Australian University Director of Digital Education)

Furthermore, a lifetime of the broadest form of higher education and the benefits it provides to learners of every demographic denomination, disciplinary aptitude, job orientation and stage of employment history demands political leadership that understands and invests not in a selective (and politically-convenient) but *holistic* value proposition. Consequently, recent announcement by the incumbent UK government to place caps on degrees with poor retention rates and/or inferior labour-market articulation – ‘rip-off courses’<sup>28</sup> – is troubling in so much as it privileges a highly reductionist and arbitrary value determination of the higher education offering, which will likely further increase institutional stratification and inter-institutional competition while reducing opportunities and options for lifetime learning for the widest population. Such an approach neglects the growing non-linearity of educational/job transitioning and re(entry) enabled by digitalisation and the profoundly limiting effects to talent pools caused by excessive valorisation of (typically STEM) subject disciplines (with higher associated salary returns) and knowledge and skill specialisation that ignore the vicissitudes of a digitalising global labour market.

## **Discussion**

There are clear opportunities and challenges associated with the digitalisation of higher education. The transition to online platforms for delivery of taught content as a result of the physical closure of campuses due to COVID-19, has shown, perhaps above all else, the value of digital tools to universities’ sustained educational provision. In fact, this experience shows how universities have in most cases successfully adjusted to online delivery and reveals something of an attitude change among faculty and students in the use of digital tools for teaching and learning, respectively, and even though many universities have sought a return to, and re-privileging of face-to-face provision. The enhanced flexibility and accessibility and opportunity to personalise learning provided by a digital pedagogical interface are qualities hard to dispute yet are insufficient gains in terms of rationalising an end to campus-based education.

At the core of campus-based education is social interaction or rather a depth and diversity of social interaction that currently cannot be reached or replicated given the limited tools at the disposal of most universities where the richness and complexity of human emotion are typically curtailed to symbolic cues. This is not to say, that technological innovation will not provide for deeper forms of social interaction – tools for virtual and augmented reality, such as currently being pioneered by the University of Michigan in conjunction with Coursera (Corp 2022), hold such potential – however their wide investment and application is not yet apparent. Social interaction of course is the basis of accumulated experience and thus by extension, as posited by educational theorists from Dewey to Kolb, the cornerstone of successful learning. And so, while many detractors of traditional tools of university education claim a poverty of learning organised around social interaction, they may be guilty of underestimation. Moreover, it may well be that students, educators, employers, *et al.* – are not yet ready:

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<sup>28</sup> <https://www.theguardian.com/politics/live/2023/jul/17/two-child-benefit-cap-labour-conservatives-rishi-sunak-education-uk-politics-latest>

*“It really comes down to the human factors associated with how quickly people can move with technology . . . There is no doubt that we could today deliver remote learning in ways that would, you know, blow people’s socks off, and would wonder why we’d ever need a physical campus again, but the humans involved in the process aren’t ready for and it’ll take them another decade or two to be ready for it.” (US University Director of Digital Education)*

It may also be the case that disruption ultimately galvanises (market) confidence in the ‘tried and tested’ and stabilises education and labour market transactions meaning as one of our interviewees explained, that “the old-fashioned credential may become more sought after, may become more important than less important”. The revalorisation of the ‘tried and tested’ may also undermine universities’ capacity to extend themselves in provision of a digitalised world where demand for reskilling and upskilling is super-abundant yet unmet by disinterested elite educational providers:

*“It’s still the 18 year-olds that they’re targeting. You know, if you look at it, it’s still the 18 year olds they want. They don’t want working adults. They are not catered for that. That’s a whole other level of what it means to be a member of the university if you’re serving adults that are in work, that have families. The infrastructure is not there to support that population.” (US EdTech Expert)*

Yet, it is not only infrastructure but systems of reward and recognition for university staff that underpin digital change. We spoke earlier for instance of universities failing to accommodate digital transformation into faculty workloads. Such a resourcing failure is compounded by the absence or else inadequacy of existing value systems within universities that fail to recognise and compensate and thus incentivise staff to embrace digitalisation:

*“People are not measured generally within the institutions I’ve worked in by their ability to deliver digital transformation, however, you define that. Their success is still defined by how many masters students they’ve supervised, student feedback, papers published.” (UK Director of Digital Education)*

A burden to digitalise will likely thus become a matter of personal responsibility, and yet again unequal investment which may only further the patchiness of educational quality provided by universities and their ability to cater for life-long learners and by extension life-long workers. Personal responsibility is, however, a theme with positive connotations for online learners, where arguments are made for instance that earlier exposure to online learning, for instance among undergraduate cohorts, is facilitative of ‘learning to learn’ and will provide for more empowered, self-reliant learners and crucially, future workers:

*“This is the benefits around learning to learn - if we have undergraduate students who have had a taste of what it means to have to self-regulate themselves and be able to learn online and then come into the classroom. It means that they will have a better handle of having to do that, throughout their professional lives. It’s a transitioning tool.” (UK Director of Digital Education)*

Relatedly, those we consulted also felt that online learning benefitted from an incremental approach and advised against its full exposition at undergraduate levels:

*“The majority of 18 year-olds are not equipped to study online straight out of school. I also think that the appetite for doing that for that age group at that age level is very small . . . Online learning requires a different set of skills and I just think it fundamentally works better for people who have already progressed through a sort of more traditional on-campus learning experience . . . The learning to learn aspect of undergraduate study I think is very, very important, and that is more often done better on campus than it is online.”* (UK University Head of Online Learning)

Online higher education may be personalised but it may not be personal, in so much as the learner is ultimately always physically alone. Physical isolation of this sort may be especially problematic in the context of a global mental health crisis and the ubiquity of mental health problems faced by university students. The pandemic has revealed the mental health cost for students who have been separated from their peers and their tutors, and physically cut-off from their institutional communities, and relatedly the significant uplift in demand for pastoral care. However, there is also evidence of how technology may be purposed for the alleviation of mental health problems, where on-campus provision typically falls short of needs, take for example learning analytics deployed to identify at-risk students or the role of online support services, chatbots and apps (JISC 2019). There is also an argument (Sheller and Urry 2006) that the privileging of physical proximity and ‘placement’ of people according to the ‘boundedness’ of their physical co-location – in this case, the university campus – actually denies the kinds of social mobility that enriches social interaction and the bondedness of learning communities (see also Bayne *et al.* 2020).

An emphasis on personalised learning is understood by Neem (2019) as an ‘individualist fallacy’, and a misunderstanding among online learning advocates of how students like to learn and how teachers teach. Much of the focus of online learning also appears misplaced – and here again we agree strongly with Neem – where it is directed at more mature, returning and/or even non-traditional cohorts, who are assumed to be without need or opportunity to benefit from the abundance of social interactions found in campus settings. Thus, while online education may provide greater flexibility and accessibility, it might not be thought of as the solution to the limitations of campus-based learning. Instead, universities need to consider how they make the social richness of their campus-based offering, that many recognise as integral to the efficacy of students’ higher education – and future work transitioning and ongoing evolution – more widely and easily available. Much of this, we would argue, is dependent upon a meaningful investment in pedagogical innovation – recognising that aspects of teaching and learning in universities can and should be improved.

Universities are not particularly reflexive spaces of teaching and learning – and pedagogy tends to remain rooted to practice as opposed to *praxis*. While efforts to professionalise teaching in universities are widespread, there is considerable and reasonable scepticism as to their precise contribution (*cf.* Goodall 2023) and the extent to which, if at all, they have improved pedagogical competencies and the quality of students’ higher education experience. Much of a lack of effect may be attributed to professionalisation measures being approached by faculty (and administrators) as tick-box exercises and teaching typically having lower status as an academic function in universities. Academics’ career progression is for the most part driven not by accomplishment of teaching but research.

Concurrently, more innovative and risky forms of pedagogy may be constrained by a culture of risk aversion in universities and the challenges presented by the erosion of academic freedom on campus and the risk of institutional sanctioning where lecturers are adjudged to have engaged (or be that, compromised the welfare of) their students with ‘inappropriate’ content or methods of instruction (*cf.* Watermeyer, Raaper and Olssen 2022). The greater incorporation of technology into pedagogy raises similar ethical concerns as to the extent to which learners may be negatively impacted – for instance as relates to digital privacy – and unevenly so, where technologically facilitated higher education varies in quality and scope, depending on institutional context and country setting and therein levels of investment, the quality of existing infrastructure and strategic leadership (*cf.* Fraser-Krauss 2022).

For technology to improve pedagogy, universities will need a greater investment in people and staffing on non-precarious terms – terms that adjust and compensate for a recent history in numerous leading higher education systems like Australia, the US and UK, of work intensification, casualisation, bureaucratisation, competitive inflation, inadequate remuneration, and poor attention to matters of health, wellbeing and equality. Higher education must be seen as an attractive place of work for teachers (able to integrate technology into their praxis), learning designers, digital technologists and other kinds of staff integral to the successful implementation of digital pedagogies. These are a talent pool seemingly in short supply.

Technology for education should not be misunderstood as substitutive of human labour, which will remain increasingly important in a world organised around not *less* but *more* human/technological integration, with technology scaffolding and enhancing the pedagogical contribution of teachers or as one of our interviewees put it, enabling the “Professor to be better at their job. Like you know, putting on an exoskeleton for a soldier”. There is, of course, potential that technology applied as chat-bots and AI tutors may be rationalised as a cost-saver by institutional leaders, especially those whose institutions find themselves financially challenged. However, there is still ‘limited robust evidence that might be able to point to the sustained educational impacts of these technologies’ (Selwyn 2019: 64) and we would argue with Mirrless and Alvi (2020: 99) that ‘Institutions of higher education are only as good as the people they employ to do the intellectual and emotional work of educating’.

Excessive leaning on technology as a cost-efficiency would no doubt further swell a trend of ‘adjunctification’ and increasingly frugal use of lecturing staff for taught delivery in universities, while further intensifying the demands placed on those left in post. In turn, the increasing social distance of learner from human teachers might, given the current limitations of learning technologies to adequately compensate, serve to impoverish and impair the pedagogical interface. Technology in other words should be used to enable and further enhance the social dimensions of (in-person) learning so richly and successfully operationalised in highly selective, elite institutions (with high graduation and employability rates) and be considered and treated not as the edifice or structure of education, rather its scaffold. Such appeals, however, may hold little traction where those bought into education’s techno-solutionism do so on the basis not of pedagogical efficacy but cost efficiency (*cf.* Mirrless and Alvi 2020). Moreover, human-centric education, the kind celebrated within elite institutions, has no broad replicability, and fails to complement universal demands made of universities in reskilling and upskilling the masses.

Education provision may also need to break from the traditional university calendar of academic terms or semesters to incorporate – as is already the case in some universities – low-residency programmes, that provide students high contact with tutors over short intensive periods of time. Online higher education, in other words, may be part of universities’ offering without sacrificing face-to-face contact.

The relationship between EdTech and universities in providing an education for university students, enabling them to become ‘world ready and resilient’ in response to the fluctuations of labour markets by technological innovation is also non-substitutive and instead reciprocal. Universities, even the most prestigious and technologically resourced, will likely lean on private sector EdTech providers – or as the rapid evolution of AEd shows, Big Tech, to do some of the intermediary work of linking with industry in enriching students’ experiential learning – allowing them to get on with their core business as education and research organisations. Changing market dynamics may of course mean, as we have argued, that many less prestigious higher education providers get pushed out. If they don’t, they will likely need to merge to form more economically robust and pedagogically relevant institutions. One of our interviewees for instance, described the strong potential of downsizing for a bloated global higher education sector, comprising approximately 21,000 accredited/recognised universities<sup>29</sup>, and the creation of mega-universities, “behemoth institutions that are able to drive the cost of degrees down and really make it [higher education] accessible” (US University Director of Digital Education). That such a consolidation of (identikit) higher education provision through institutional merging, is infrequent, was for some of our interviewees, evidence of the extreme idiosyncrasy in the way higher education is organised and the way with which its value proposition is compromised:

*“You’d struggle to find that many industries that have thousands of institutions globally that are pretty much serving the same problems in many, many similar ways, with very few synergies.”* (Australian University Director of Digital Education)

Our interviewees also considered that sector contraction would advance with fuller recognition – catalysed by the ubiquity and persuasiveness of performance rankings and growth in increasingly savvy higher education consumers – of a global higher education sector saturated with a glut of providers that . . .

*“. . . are not premium brands they’re just kind of places you go because they’re in the community and they’re nearby. So, I think, when you really dig beyond the top 5%, the brand isn’t really there in the first place and isn’t incredibly hard to displace when you have better alternatives.”* (UK University Director of Digital Education)

The necessary scalability of higher education will not occur by universities continuing to work in silos and as market competitors. Instead, more in the way of an ecosystem approach, such as provided by the likes of ECIU<sup>30</sup>, and of students benefitting by studying across multiple

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<sup>29</sup> <https://www.whed.net/home.php>

<sup>30</sup> ECIU University was formed in 2019 comprising 12 younger and entrepreneurial universities across Europe. The aim of ECIU is to repurpose the notion of a European university by evolving into a deeply connected ecosystem that collaborates across disciplinary, institutional and geographical boundaries. The activities of ECIU are based on an immersive mixed reality learning and knowledge infrastructure enabling systematic inquiry, experimentation and co-creation. By centring on complex authentic challenges and informed by design thinking ECIU aims to overcome a growing disconnect between research, learning and innovation through open

campus and employer-based scenarios will enable the kinds of varied, immersive, and experiential learning, aspired to. This will enable students to benefit from opportunities not only reserved for those at institutions like George Washington, or Pace University in New York, who have the geographical advantage of proximal location to major employers. However, and it is a big ‘however’, to truly close the degrees of separation between universities and employers a step change in attitude among the latter is crucial. One of our Finnish interviewees for instance stated that, “there’s a gap between the companies and what they think about continuous education. They don’t think about higher education in the first place”.

Universities need to press their case. There needs to be a total opening of campuses – and mobility across – much as has previously been aspired to by governance innovations like the Bologna Process<sup>31</sup> and is practiced by disruptor institutions like Minerva, and extension of this to all educational institutions formal, nonformal, informal and at compulsory education stages. Some of this will be digital but it will have an in-person core. The commercial EdTech sector has a role, perhaps mainly as a relational broker, in working with universities in maximising their public contribution, but it is universities themselves that ought to grab the advantage at their disposal in leading the way:

*“Universities are in the best position to lead this next generation, to be at the forefront of what the industry needs and what students’ needs.”* (UK University Director of Digital Education)

However, as we have argued, universities are notoriously slow to adapt and to innovate their practices; stymied by resistance from within their internal communities, predominantly from academic faculty, who have been historically ambivalent, if not deeply suspicious, of work-based interventions that might challenge or weaken their professional autonomy. The recent experience of forced transitioning to remote delivery has challenged this mindset, meaning that the potential for universities to modernise their pedagogical approach is unleashed:

*“The buzzsaw of faculty resistance prevented them for even approaching it. Now that buzzsaw is gone all of a sudden. We have a real opportunity here. Faculty resistance to the medium has vanished. Now, we can take advantage of this moment to change what we do, to take advantage of the medium, as opposed to have the medium just accelerate what we were doing already.”* (Australian University Director of Digital Education)

Disruption to the higher education value chain may be integral to realising the potential of universities to fix some of their current shortcomings. An opportunity for meaningful long-term adjustment, further to the pandemic’s great digital experiment, that might better enable universities’ contribution to preparing ‘world ready and resilient’ students – to realising *Bildung*

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science, open learning, and open innovation. Micro-credentials are in that context seen as an opportunity to reconceptualise higher education with more fluid boundaries between education, lifelong learning and innovation. It is a departure from rigid and siloed academic disciplines and degree structures towards a model of lifelong learning where all learning is recognised and valued regardless of context. It is in that sense also a shift from perceiving learners as customers in a transaction-based business model to a lifelong and life-wide relational model of engagement.

<sup>31</sup> <https://education.ec.europa.eu/education-levels/higher-education/inclusive-and-connected-higher-education/bologna-process>

– is now. There are open roads and *cul-de-sacs* to them realising this public good, but it is achievable. There are big questions and caveats to answer too, not least of a techno-ethical nature and as relates specifically to datafication practices and AI. How might for instance generative AI tools be used in non-discriminatory ways where algorithmic formulas are inherently biased? How can we ensure that the use of datafication in education does not breach the privacy and security of learners participating in digital spaces? There is also good reason to believe that universities' fuller embrace of online education will ultimately be a consequence of market rationalisation (*cf.* Bayne 2021) and far less about digitalisation servicing the 'right to education for all' and as 'an empowering tool for being active members of society' (United Nations 2022).

There is, furthermore, much more research to be committed in understanding what is happening at the epicentre of universities' (however incremental) transformation and their use of digital technologies in preparing workers and citizens of the future. Accordingly, our work is committed to breaking down the impasse of a value proposition for higher education that has become mired by two competing perspectives: one that espouses universities as broken tools of the knowledge economy, the other that warns against universities' encroachment and incorporation by digital technology. A contextual approach is needed that contends with various tensions and contradictions implicit to technological implementation in the higher education fold and moves away from what one of our interviewees described as the 'nonsense' of 'binary type debates'.

The future role and contribution of the university to the future of work might only be understood away from the hype of technological solutions to educational, economic and societal problems. Which is not to say that technology cannot and should not serve an important role in enabling higher education to better service the needs of students who will need to cultivate, as one of our interviewees put it, "broader higher order capabilities that enable them to be successful in a highly ambiguous fast changing world". As we were repeatedly reminded through our study, the focus of higher education, "can't simply be learning the latest technical skills, because that's only going to serve you short term".

For higher education to better or best enable those it serves to be ready for and resilient to the changes that will accompany their lifetime of work and living, universities as its major provider, will need not a total revolution as some exhort, but a shift of mindset. A reformist attitude to higher education, that dispenses with false signifiers of worth and their competitive accumulation – for instance, performance rankings and other such illusions of prestige economics – is a major first stage in getting universities to work productively together and collaboratively with others within a global knowledge ecosystem. It would also comprise a major step in enabling communities of those with student-facing roles within universities to work more cohesively and fluently across boundaries.

For universities to authentically service their 'public good' role, they need to become more authentically accountable, honest and open to their (resource) limitations, and exercise far greater openness to working as a harmonised community, where resources are pooled and temptations to sequester into competitive siloes are overcome. Claims to be the world's best at this, or that, need to be abandoned and replaced with a genuine commitment to collective problem-solving and responding to global changes and challenges that might otherwise be only superficially or weakly managed where approached on a solitary basis. Digitalisation



provides the medium by which universities can work together in resolving the many pedagogical deficits they are historically accused of, and which they struggle to overcome in isolation. But this depends on them climbing down from their 'ivory-tower' mentality:

*“Universities need to keep pace with everything that goes on outside of them. We cannot view ourselves in this, you know, compartmentalised island state kind of way.”* (UK University Director of Digital Education)

*“The university sector is fascinated by itself. It needs to do better by looking beyond itself.”* (US University Director of Digital Education)

For universities to realise the potential of digitalisation also depends on the provision of opportunities for faculty to work in genuinely collaborative ways with in-house learning technologists, and as one of our Australian (University Digital Education Director) interviewees explained, “academics working with learning designers in a much more co-production fashion”; and somehow as we have previously discussed as factored into workload. Moreover, the potential of digitalisation and the lessons of rapid transitioning during the pandemic, ought to be grasped by universities in becoming not only more adaptable and responsive to change but proactive and prescient of it. Such is the need if universities are to maintain their value proposition in a fast-changing world. As one of our interviewees stressed:

*“Students need to have the latest skills and capability to be ready for the jobs of tomorrow but how do you do that if it takes you six months to even get the sign off to buy a bit of technology. The world has already moved on.”* (UK University Director of Digital Education)

A need to operate at pace is especially challenging for most universities as highly bureaucratic organisations operating within complex and slow-moving governance structures and regulatory regimes, leading some of our interviewees to claim that “the most exciting innovation comes from challenger universities that don't have any institutional bureaucracy, and far fewer limitations” (US Digital Education Expert). The expansion of alternative course provision within universities was also consequently presented by some of our interviewees as one route out of the impasse of approval processes that render universities unresponsive to external demands:

*“In US institutions it's much easier to get a non-degree, non-credit program through our governance. The politics of getting a new master's degree? You know it takes two years and every committee under the sun to do that. We're not sort of fast and agile on that side.”* (US University Director of Digital Education)

Thus, while the speed of universities in responding to external events and pressures is often glacial, it is encouraging to see in the UK, the Russell Group collective of pre-eminent research universities publishing a set of (albeit generalist) principles on the use of artificial intelligence for teaching and learning purposes, intended among other things to build students' AI literacy (Russell Group 2023). Countries like Japan are also leading conversations about the appropriate use of AIEd for higher education (Kakuchi 2023) and establishing guidelines intended both to mitigate the associated risks and maximise the associated gains of widespread adoption.

More leadership like this is surely needed but is also, as our interviewees suggested, sorely lacking. For a fully reformist agenda and changed mindset to materialise, braver leadership is necessary:

*“There’s a need to replace an entire level of leadership across higher education institutions with that which is more imaginative, more creative, and frankly braver about this kind of stuff. Rather than constantly just hoping that they can tinker around the edges and not change anything.”* (UK University Director of Digital Education)

Stronger leadership within the higher education sector was also considered important to redressing and (re)educating political leaders on the value of technologically facilitated forms of educational provision and in establishing political legitimacy. Some of our UK interviewees for instance discussed how government policy for higher education was a source of profound obstruction for universities digitalisation:

*“I think the policy context really does not help in the UK. I think the policy angle is very strong. You know, return to the office, return to the classroom, return to teaching in person. I think universities are between a rock and a hard place. On the one hand, they want to be cutting edge and competing on the other hand, policy says, face-to-face contact hours are essential and I think that is why it’s patchy and stopping people buying into more innovative technologies.”* (UK University Director of Digital Education)

The COVID pandemic has revealed much of what universities are good at and poor at, in terms especially of their pedagogical resolve and capacity to continue to provide education despite the most adverse conditions. It has also shown that university communities are not entirely inflexible and are able to transition to other working paradigms; what now appears a permanent move towards hybrid working (on campus and remote) is testament to this. Perhaps, more cynically, the pandemic has provided a necessary jolt for university leaders that the status quo is no longer enough and has provided, as one of our interviewees described, “the wake up call for some forward thinking administrators to realise that if we don’t actually fix the core of what we’re doing we’re going to be in a heap of trouble” (US University Director of Digital Education).

But perhaps most of all, the pandemic has revealed that universities cannot go it alone. Their responsibility and accountability to a world, never more in flux, demands that a collective spirit of enterprise takes precedence over concerns of institutional prestige and survival. 21,000 institutions doing pretty much the same thing is to the advantage of no-one. It is a non-sustainable arrangement. There is a pressing need, therefore, to do more with less, which technology can facilitate. This should not mean less availability or access to higher education. In fact, a more-integrated, focused and less crowded approach will help universities maximise their offer and quieten the clamour of those who question their efficacy, and concentrate attention on core pedagogical ambitions. Thus, we would argue that a more stable and consistent system of higher education funding, recognition and reward is crucial to helping universities cultivate world ready and resilient citizens. But much as individual universities, higher education sectors cannot do this alone. This requires country level co-operation and

consensus as pertains to higher education's value proposition and not only to a national but global workforce.

In close, we would propose that higher education is far from broken. It may be sub-optimal and require significant improving – the contribution of AIEd in such terms may be sizable and sizably risky – but it provides a resilient (if not quite, stable) 'platform' from which socio-technical futures may be fashioned for a better future of work and society.

## **Conclusion**

Higher education's relationship with technology has been historically difficult and in present and future times will likely be no less complicated. Digitalisation and transition to platformised, hybridised and even AIEd facilitated forms of teaching and learning hold significant promise in terms of mobilising higher education as a lifelong process, supporting individuals through potentially infinite disruption to, and reinvention of their working lives. Yet the contribution of technology to positively affect higher education and its internal communities and external stakeholders is not clear cut. The global HE community is barely beyond 'proof-of-concept' in its use of AIEd, and it is too early to authoritatively say how it is and will be profitably applied by students, academics and administrators and furthermore impact universities' role in (re)preparing change resilience and adeptness among those it educates and trains. We can, however, be confident in recognising its versatility and multi-applicability to a plethora if not complete collection of higher education functions. Productive and cost-saving gains are quite possibly huge yet the manifestations of these will undoubtedly be tempered by techno-ethical concerns as relates for instance to integrity and honesty or fraud and fakery, and the short-term implications of automating functions through AIEd to human labour.

The role and capacity of universities in attending to the needs of learners/workers in a digital age/era is also, as we have discussed, influenced and habitually hamstrung by a range of factors like traditionalism, technophobia and resistance to structural and cultural reform and the deadweight of prestige economics. It has taken a crisis of unprecedented scale in the shape of the COVID-19 pandemic to help deflate the stigma of online educational delivery and accelerate acceptance of its value both within and outside university communities. Yet the marker of educational quality, and the value proposition of higher education to those who seek to better themselves through enhanced knowledge and skills facilitated by technology, remains stubbornly attached to the acquisition of brands with high value recognition. Consequently, the democratising potential of technology for education, will likely remain, at least for the time being, checked by a badge not of knowledge/skill proficiency but social affiliation and the appropriation of technology for the purpose of social stratification.

AIEd is already having major implications for thinking through how universities teach and assess and how students learn, and how all of these relate to a future context where an ability to operationalise generative AI tools will be a core requirement (and affordance) of most types of job. Where the COVID-19 pandemic awoke universities with a jolt to the immediacy of their digital futures, AIEd would appear to be front and centre of sustained cultural and organisational reform that might assist with the necessary job of bringing universities and their various stakeholders together. It may just prove to be the glue that galvanises the oft proclaimed, yet frequently un(der)substantiated triple-helix (Etzkowitz and Leydesdorff 1995) of universities, government and industry; a motivator for policy that enables rather than inhibits higher education digitalisation.

So where then from here? We close with a series of core observations and recommendations which we believe are especially salient to ongoing discussion as to the impacts of digitalisation on higher education and universities' (at risk) role in facilitating world-ready and resilient citizens.

- Universities must take a leading role in developing guidelines – in conjunction with all educational stakeholders – for the appropriate use of AIEd, drawing, where possible on international examples of best practice so as to mitigate the potential deleterious effects of its growing use as a learning technology and to maximise its learning potential – for instance in the development of AI skills. Scholars engaged with research into the social, ethical, and pedagogical application of AIEd, must be engaged to ensure guidelines are theoretically and empirically robust.
- Universities need to embrace the speed of thought and decision-making they demonstrated during the pandemic without forfeiting diligence and rigour and whilst ensuring that the application of digital tools is predicated on consensual use in the enhancement of teaching and learning.
- Those at the forefront of educational delivery such as academic faculty and learning technologists within universities must be included in conversations about the appropriate use of AIEd and other digital technologies employed for teaching and learning purposes, especially those which access and make use of user-data. Academic faculty and those in universities supporting teaching and learning offer invaluable first-hand insight into what technologies might work best for students and in enhancing both the classroom experience and learning outcomes. Their input is also vital in establishing codes of practice related to datafication and the use of digital tools as instruments of surveillance and performance management that may further erode pedagogical autonomy and inhibit creative use of digital tools for pedagogical purposes.
- Regulation should serve to quality assure the higher education offer less constrain the ability of universities to operate proactively rather than retrospectively to digital needs and other external demands.
- Universities around the world need to commit to measures that break the paralysis of prestige economics and disinvest in forms of competitive accountability manifest most glaringly in ranking culture, in order to forge robust inter-institutional and stakeholder synergies that might maximise the benefits of digital technologies for educational purposes.
- Digital literacy in universities is a necessary growth area, especially as applies to institutional leadership. Scarcity problems might be redressed through dedicated investment in digital literacy building and greater sharing of institutional expertise and infrastructural resources. Workload arrangements and reward and recognition systems for faculty need to reflect digital pedagogy as a priority concern. Such steps are crucial to the development of digital ecosystems that can best support the ongoing knowledge and skills needs of the widest possible demographic.

- Pedagogical complacency driven by lazy assertions that established and typically ‘analogue’ teaching practices are best and ambivalence in the use of EdTech by faculty as a consequence of techno-ethical complexity; obsolescence concerns particularly as relates to the potential proliferation of chatbots and AI-tutors; and additional work demands caused by (continuous) upskilling needs, may only be resolved with the provision of space and time for experimentation with digital tools. Moreover, investment in flexible digital infrastructure and fuller accommodation for interoperability is essential to universities’ pedagogical growth – not least where the learning interface is dominated by students using their own devices and a bring-your-own-device (BYOD) culture.
- The shortcomings of digital technology should be embraced as opportunities for learning. For instance, the ‘hallucinations’ or factual inconsistencies produced by AIED tools like ChatGPT should enable more discriminating and critical use rather than wholesale reliance.
- The time efficiencies offered by digital technologies to educators need full identification and protection to ensure that their pedagogical benefit is not wasted nor translated into justification for increased work burden. Full consideration must also be given to what tasks might be automated. Some tasks no matter how seemingly trivial or laborious take their success from human interaction.
- Many digital technologies are offered initially without charge in order to stimulate user growth and user dependency while concurrently providing a mass user testbed for product refinement and development of next generation tools that come with a charge. There are inherent dangers to a ‘freemium/premium’ differentiation for EdTech, principal among which is an exacerbation of digital inequality among learners whose level of access to digital tools may have profound impacts on learning outcomes, knowledge and skill development and digital capabilities.
- There is much hysteria concerning the negative impacts of AIED in terms of assuring the credibility of learning outcomes and learner competencies. But assessment concerns should be much more strongly focused on identifying what should be prioritised as learner competencies, for instance the ability to utilise digital tools in pedagogical settings. Moreover, universities must address the impact of AIED on core curricula, what is taught and learnt, or rather should be, in the context of AIED displacing knowledge and skills needs. The latter includes what the core curriculum for AI is and/or the extent to which it is integrated across curricula.
- Higher education leaders (and higher education stakeholders) must consider the extent to which AIED and other digital technologies are fixing or producing new educational problems and resist technological determinism.
- AIED as many other digital technologies are a part of a pedagogical toolkit, whose benefits are poorly understood and/or acknowledged. Positive pedagogical disruption by digital tools, has until the arrival of LLMs been largely muted, certainly in terms of any tangible benefit to learners. In fact, much pedagogical practice in universities is stubbornly unchanged. The pandemic experience provided the basis for not only

rethinking but experiencing how higher education can be delivered and while there is evidence of some degree of 'snap-back' to tried and tested approaches to teaching and learning, AIED has provided momentum against a slide back into pedagogical inertia, which needs to be harnessed.

- The cost-efficiencies of digitally mediated and/or online higher education must not contribute to pedagogical poverty in universities. Despite the many pedagogical possibilities of online education, digital tools routinely fail to be integrated into a paradigm of teaching and learning that provide enriched learning experiences and outcomes. Instead transitions into the online space are for the most part replications of pedagogy practiced offline. A dearth of pedagogical innovation via digital tools relates to a shortfall of institutional investment not only in digital tools and infrastructure but strategy for digital learning and teaching, common to only but a few universities, and a preponderance of bureaucracy that stifles opportunities for pedagogical reform. Exploiting the possibilities of digital tools for higher education requires efforts to loosen a bureaucratic straitjacket that perpetuates a culture of creative inertia for teaching and learning.
- Universities' movement as providers within the lifelong learning space is typically slow and piecemeal. Alternatives to established degree schemes are predominantly peripheral and are not prioritised within the business models of most universities, especially elite universities. Where provision exists, it is organised more as a marketing exercise and not as substantive re-rationalisation of the taught offering. However, there is emerging evidence of a wind of change in universities' provision of micro-credentials for instance in international higher education settings like Ireland, where an association of seven universities has seen the platform launch of 300 university accredited micro-credentials (Walshe 2023). Moreover, while the Stanford2025 open-loop model of higher education hasn't quite taken off, the downturn in higher education participation we reported at the outset of this paper, gives good reason for its further consideration (cf. Lu 2020).
- Universities' role in the continuous-education space is, as the example of Finland shows, potentially compromised by a failure of advocacy and humility – communicating what they can and also what they can't offer. Such steps are necessary in breaking the current *"situation where employers don't see higher education as an attractive option for continuous learning, either because higher education is so not well positioned with their offerings and possibilities, or employers don't even know what it could do"* (Higher Education Lead, Finland).
- Universities' fuller embrace of blended, hybrid approaches to taught delivery is inhibited in many marketised higher education settings, where online provision remains stigmatised by policy-makers and where students' value-for-money is associated exclusively with in-person delivery. A strong evidence base and vocal leadership is necessary in convincing policy-makers of the merits of online delivery as one aspect of a hybridised higher education system.
- Edtech start-ups which focus on the facilitation of customisable work-integrated learning are a valuable resource narrowing the degrees of separation between

universities and employers. However, their use by universities is seemingly limited and complements a trend of similarly limited interactions involving universities and a wider commercial EdTech sector. This is explained in part by the overextensions of commercial EdTech vendors and the consequent weariness and wariness of universities to their approach. Concerns related to corporate entities' attempts to assetize higher education are entirely plausible, however, they may also unnecessarily hinder profitable dialogue and partnership.

- The impact of the commercial EdTech sector on universities is relatively small, despite its investment growth and accelerations to digital working caused by the COVID-19 pandemic. Universities for the most part remain a low investor of externally procured EdTech, preferring instead inhouse development, which is typically characterised by limited digital infrastructure and/or infrastructural investment and scarcity of inhouse EdTech expertise. Most EdTech procurement in universities is connected with OPM services, which have a greater focus on marketing and recruitment than pedagogy. These services are stable in terms of their market supply and there is evidence of ongoing supply needs.
- Variation in response to higher education digitalisation is less marked by international than institutional contexts and *inter alia* (i) the ability to rationalise investment in digital tools and expansion of online and/or digitally mediated provision within a university's business model and strategic approach (ii) the extent of financial and pre-existing infrastructural and intellectual resources for digitalisation within a university. Notwithstanding, country-level variation in the use of digital tools, particularly AIED, will be affected by the speed and substance of new regulation. Different higher education funding models across country settings, which tend to bifurcate university participation as either a free public good or paid for private investment are also influential in shaping attitudes towards the acceptability and take-up of digitally mediated higher education.

Our final point of observation moves beyond a focus on the limited penetration of digital technologies into the teaching and learning design of the vast majority of universities – made most explicit by the attempts of many universities to prohibit the use of AIED – and considers the limitations of existing digital tools and platforms. For all the talk of datafication, learning analytics, and AIED what currently exists in the context of digitally mediated education remains some way off the forms of social interaction found in university campuses. Far from exceeding, our study reveals that most digital tools and platforms currently in use within universities are not yet commensurate with and/or fail to replicate the richness of social interaction frequently associated with in-person delivery. Digital futures of higher education will continue along a trajectory of incremental steps not least where what one of our Finnish interviewees termed, 'traditional thinking' in universities sustains. For universities to meet their responsibility in preparing world ready and resilient individuals, able to accommodate and adapt to the endless evolution of their working and social lives, cultural and organisational reform based not only on big thinking but bold moves is needed, and urgently so.

The members of the global higher education sector must assume shared responsibility in investing in leadership, infrastructure, resource and capability, regulatory and governance frameworks and ethical protocols that will allow them to exploit the affordances of digital technologies and draw consensus on the terms, including the limitations, of their use, allowing

those that pass through universities (throughout their lives) to be readied and made resilient for whatever change technology brings. A global conversation is necessary also for initiating the dismantling of an edict of competitive accountability that separates rather than unites universities in productively responding to the transformational needs of the global society. Universities need to grow up and beyond the parochialism and stuntedness of national boundaries and competitive siloes. They need to fully embrace their global (digital) citizenship and the moral obligations this brings in order especially to educate and lead the policy conversation. They must also find humility and realism in what they do and what they can achieve and what they can't. In answering calls of role and relevance amidst the turbulence of digital winds and an uncertain future, what universities are for must be considered amidst the constraints (internally and externally imposed) shaping and often denying what they can, should or are willing to do. The digital turn is making these constraints never more so visible nor in need of redress. Digitalisation may consequently prove not only to be higher education's greatest reckoning but saving grace.

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