EdTech

Pandemic Privatisation in Higher Education: Edtech & University Reform

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Education International (EI)

Education International represents organisations of teachers and other education employees across the globe. It is the world's largest federation of unions and associations, representing thirty million education employees in about four hundred organisations in one hundred and seventy countries and territories, across the globe. Education International unites teachers and education employees.

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Glossary

Commercialisation is the creation, marketing and sale of education goods and services by external providers, and includes outsourcing of tasks normally undertaken by public institutions for the commercial gain of individuals or corporations.

Datafication means the use of digital technologies to record aspects of human lives, social and economic processes, institutional activities, and so on as digitized information, often for purposes of analysis, prediction and intervention of some kind.

Digitalisation refers to the use of computer programmed technologies to perform tasks that might have previously been enacted through other analogue forms or human actions, or new tasks not possible without computation.

Marketisation is the introduction of market forces in education, where governments have created policy conditions that promote the development of markets in state funded and/or state provided services.

Privatisation aims to bring about the supposed benefits of marketisation for education systems - such as efficiency and effectiveness - by drawing on techniques and values from the private sector, introducing private sector participation, and/or making public education more like a business.

Summary

During the COVID-19 pandemic, a state of emergency engulfed higher education (HE). The crisis of mass campus closures and a rapid 'pivot' to online learning became the context for attempts by private actors and commercial organisations to reconfigure the sector. Besides the immediate and necessary short-term 'relief' provided by education and technology providers during campus closures, commercial organisations and private sector promoters sought to 'reconstruct' HE for the long term. Temporary emergency measures were treated as experimental opportunities to establish a new 'digital normalcy' in which private and commercial actors could play a substantially increased role in schools, colleges and universities worldwide, with wide-ranging implications for the experience of students and the working lives of staff. The effects are likely to continue unfolding as institutions and national systems deal with the rolling disruptions of the pandemic, and the emergency 'pivot online' translates into long-lasting sectoral changes. Digital technologies and private sector participation can bring many benefits to HE, but many of the transformational changes promoted during the pandemic also present serious challenges. This report documents key ways commercialisation and privatisation of HE have been - and continue to be - advanced through digital technologies in the context of COVID-19, identifying issues and implications for more detailed discussion and deliberation as HE sets out on the long path to post-pandemic recovery. The summary findings include:

- **Pandemic privatisation through multi-sector policy.**
  Emergencies produce catalytic opportunities for market-oriented privatisation policies and commercial reforms in education. The COVID-19 pandemic has been used as an exceptional opportunity for expanding privatisation and commercialisation in HE, particularly through the promotion of educational technologies (edtech) as short-term solutions to campus closures and the positioning of private sector actors as catalysts and engineers of post-pandemic HE reform and transformation. The pandemic privatisation and commercialisation of HE during the COVID-19 emergency is a multi-sector process involving diverse actors that criss-cross fields of government, business, consultancy, finance,

and international governance, with transnational reach and various effects across geographical, social, political, and economic contexts. It exemplifies how 'disaster techno-capitalism' has sought to exploit the pandemic for private sector and commercial advantage.

- **Higher education reimagined as digital and data-intensive.** Diverse organisations from multiple sectors translated the public health crisis into an opportunity to reimagine HE for the long term as a digitally innovative and data-intensive sector of post-pandemic societies and economies. While face to face teaching constituted an urgent global public health threat, it was also constructed by organisations including education technology businesses, consultancies, international bodies and investors as a longer-term problem and threat to student 'upskilling', 'employability', and global post-coronavirus economic recovery. Framed as a form of 'emergency relief' during campus closures, education technologies were also presented as an opportunity for investment and profit-making, with the growing market of edtech framed as a catalytic enabler of long-term HE reconstruction and reform.

- **Transformation through technology solutionism.** Education technologies and companies became highly influential actors in HE during the pandemic. Private organisations and commercial technologies have begun to reform colleges and universities from the inside, working as a social and technical infrastructure that shapes institutional behaviours and, as programmed pedagogical environments, determines the possible organisation of teaching and learning. In the absence of the physical infrastructure of campuses and classrooms during the pandemic, institutions were required to develop digital infrastructure to host online teaching. This opened up new and lucrative market opportunities for vendors of online learning technologies, many of which have actively sought to establish positions as partners in long-term transformations to the daily operations of colleges and universities. New kinds of technical arrangements, introduced as temporary emergency solutions but positioned as persistent transformations, have affected how teaching is enacted, and established private and commercial providers as essential infrastructural intermediaries between educators and students. These technologies are enacting significant changes to the teaching and learning operations and practices of HE institutions, representing a form of solutionism that treats all problems as if they can be fixed with digital technologies.

- **New public-private partnerships and competition.** New public-private partnerships developed during the pandemic blur the boundaries between academic and industry sectors. Partnerships between academic institutions and the education and technology industries have begun to proliferate with the development of business models for the provision of online teaching and learning platforms. Global technology companies including Amazon, Google, Alibaba and Microsoft have sought to extend their cloud and data infrastructure services to an increasing number of university partners. Colleges and universities are also facing increasing competition from private 'challenger' institutions, new industry-facing 'digital credential' initiatives, and employment-based 'education as a benefit' schemes offering students the convenience of flexible, affordable, online learning. These developments enhance the business logics of the private sector in HE, privileging education programs that are tightly coupled to workplace demands, and expand the role of for-profit organisations and technologies in the provision of education.

- **Increasing penetration of AI and surveillance.** Edtech companies and their promoters have increased the deployment of data analytics, machine learning and artificial intelligence in HE, and emphasised the language and practices of 'personalised learning' and 'data-driven decision-making'. Organisations from across the sectoral spectrum have highlighted the importance of 'upskilling' students for a post-pandemic economy allegedly dominated by AI and automation and demanding new technical competencies. AI has also been enhanced through the deployment of large-scale data monitoring tools embedded in online learning management software, surveillance technologies such as distance examination proctoring systems, and campus safety systems such as student location and contact tracing apps. In imaginaries of the AI-enabled future of HE, next-generation learning experiences will be 'hyperindividualised' and scaled with algorithms, coupled with digital credentialing and data-driven alignment of education with work.

- **Challenges to academic labour, freedom and autonomy.** The professional work of academic educators has been affected by the increasing penetration of the private sector and commercial technology into HE during the pandemic. Staff have had little choice over the technologies they are required to employ for their teaching, resulting in high-profile contests over the use, in

particular, of intrusive surveillance products or concerns over the potential long-term storage and re-use of recorded course materials and lectures. Academic educators have been required to double up their preparation and delivery of classes for both in-person and online formats. Classes and events featuring 'controversial' speakers or critical perspectives have been cancelled due to the commercial terms of service of providers of online video streaming platforms. The expansion of data analytics, AI and predictive technologies also challenges the autonomy of staff to make professionally informed judgments about student engagement and performance, by delegating assessment and evaluation to proprietorial software that can then prescribe 'personalised learning' recommendations on their behalf. Finally, academic freedom is at risk when online teaching and learning conducted in an international context runs counter to the politics of certain state regimes, leading to concerns over censorship and the suppression of critical inquiry in remote education.

- **Alternative imaginaries of post-pandemic HE.** Online teaching and learning is neither inevitably transformative nor necessarily deleterious to the purpose of universities, the working conditions of staff, or the experience of students. However, the current reimagining of HE by private organisations, and its instantiation in commercial technologies, should be countered with robust, critical and research-informed alternative imaginaries centred on recognising the purpose of higher education as a social and public good. The appearance of manifestos and networks dedicated to this task demonstrates a widespread sense of unease about the ways emergency measures are being translated into demands to establish a new 'digital normalcy' in HE. Educators, students, and the unions representing them should dedicate themselves to identifying effective practices and approaches, countering the imposition of commercial models that primarily focus on profit margins or pedagogically questionable practices, and developing alternative imaginaries that might be realised through collective deliberation and action.

Introduction

The COVID-19 pandemic became the context for rapid growth in the use of digital technology services in higher education (HE),[1] and an acceleration in longstanding trends of marketisation, privatisation and commercialisation in education systems around the world.[2] HE may 'never be the same again after the coronavirus crisis' but many of the problems revealed during the pandemic are longstanding.[3] The development of market-based policies and practices in HE, along with the expansion of public-private partnerships, private sector participation, and increasing involvement of commercial digital technology service providers, has a long history in many education systems worldwide (Busch 2016; Hogan and Thompson 2020; Williamson 2019). The aim of this report is to detail the expansion of higher education privatisation and commercialisation that occurred through the increased use of digital technologies during the coronavirus crisis. It is not intended to assess whether certain technology interventions 'worked' or not, or to evaluate whether online education is better or worse than in-person teaching and learning, but, by documenting private and commercial activities, to identify longer-term implications for HE staff, students and institutions.

1. Higher Education privatisation and commercialisation

The involvement of private sector and commercial organisations can valuably support the aims, values and quality of state and public education, but private and commercial actors that treat education as a market good can fragment and exploit it for private advantage or financial gain.[4] The pursuit of commercial advantage, imposition of business interests as drivers of educational change, and the introduction of market values of efficiency, competition and performance improvement can affect the mission of educational institutions, reshape educators' professional judgment and attention, and reconfigure curricula and

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1   In this report we use the term Higher Education (HE) to encompass the post-16 Further Education (FE) sector and postsecondary university education, whilst recognising that these sectors have their own unique characteristics and vary across regions.

2   Hogan, A. 2018, 12 December. Marketisation, privatisation and commercialisation in education: Defining key terms. Unite for Quality Education: https://www.unite4education.org/global-response/marketisation-privatisation-commercialisation-in-education-defining-key-terms/

3   Witze, A. 2020, 1 June. Universities will never be the same after the coronavirus crisis. Nature: https://www.nature.com/articles/d41586-020-01518-y

4   The 2019 Abidjan Principles outline the human rights obligations of states to provide public education and regulate private involvement in education: https://www.abidjanprinciples.org/en/principles/overview

pedagogic methods and practices (Verger, Fontdevila and Zancajo 2016). Privatisation and commercialisation can erode core aims of state and public education, such as the personal development, intellectual independence and social, political and cultural orientation of students as informed, responsible and active citizens (Biesta 2015). Likewise, it impacts on academic freedom, as academic work is increasingly performed through digitalized infrastructures and datafied institutions that are deeply shaped by platform business practices such as data monetisation, intellectual property ownership, and surveillance (Tanczer et al 2020).

It is clear that digital technologies enabled colleges and universities to continue offering teaching, learning and assessment opportunities during widespread campus closures across many countries in 2020, with international assessments of 'best practices' already documented including those that address key issues of access and equity.[5] However, the rapid pivot to digital teaching, learning and management technologies during the COVID-19 emergency in 2020 makes it essential to revisit longstanding questions about private and commercial involvement in education, and to consider the long-term consequences for the future of the 'post-pandemic university' worldwide.[6]

2. States of emergency, exception and experimentation

The response to the pandemic by governments and institutions has revealed both the existing extent of the penetration of private and commercial organisations in education systems and their efforts to extend their influence across all levels of schooling and post-compulsory education during the emergency.[7] At the same time, the prolonged crisis has generated further problems. HE systems in many countries have begun facing unprecedented challenges emerging from the crisis, including: budget cuts, austerity and possible bankruptcy;[8] unsustainable business models;[9] battles over academic freedom and curriculum content;[10] demands to demonstrate value for money and

5   Naffi, N., Davidson, A.-L., Patino, A., Beatty, B., Gbetoglo, E. and Duponsel, N. 2020, 30 September. Online learning during COVID-19: 8 ways universities can improve equity and access. *The Conversation*: https://theconversation.com/online-learning-during-covid-19-8-ways-universities-can-improve-equity-and-access-145286

6   The Post-Pandemic University. 2020, 21 October. Digital technology and the post-pandemic university. The Post-Pandemic University: https://postpandemicuniversity.net/digital-technology-and-the-post-pandemic-university

7   Williamson, B. and Hogan, A. 2020. Commercialisation and privatisation in/of education in the context of COVID-19. Education International: https://go.ei-ie.org/GRCOVID19

8   Carey, K. 2020, September/October. How to save Higher Education. *Washington Monthly*: https://washingtonmonthly.com/magazine/september-october-2020/how-to-save-higher-education/

9   Karabell, Z. 2020, 27 August. The Economic Model of Higher Education Was Already Broken. Here's Why the Pandemic May Destroy It for Good. *Time*: https://time.com/5883098/higher-education-broken-pandemic

10 Adekoya, R., Kaufman, E. and Simpson, T. 2020, 3 August. Academic freedom in the UK. Policy Exchange: https://policyexchange.org.uk/publication/academic-freedom-in-the-uk-2/

the 'economic returns' of a degree;[11] long-term deleterious effects of HE market reforms;[12] threats to decent work, increased casualisation, and the prospect of significant job losses.[13] Moreover, there are the complexities of campus reopenings as universities have become settings of major COVID-19 outbreaks with health and social impacts on students, staff and local communities.[14] In this exceptional context, digital technology has been presented as an effective, scalable, efficient and responsible solution both to immediate emergency campus restrictions, and to the long-term operational strategies, budgetary constraints and community responsibilities of universities, schools and colleges,[15] while simultaneously catalysing concerns about surveillance, ethics, commercialisation and privatisation.[16]

Emergencies and catastrophes produce opportunities for those advocating market-oriented policies and reforms in education, who 'can take advantage of different catastrophic situations, including natural disasters and armed conflicts and the urgency associated with these situations, to promote the adoption of pro–private sector policies' (Verger et al 2016, p. 119). As an emergency response to the disaster of COVID-19 in early 2020, institutions around the globe managed a 'pivot online' to remote teaching, learning and assessment, often by recruiting the services of digital education services suppliers.[17] In the 'state of exception' where face-to-face teaching became a health and security threat, the use of commercial educational technologies to enable remote or distance education was framed as both an extraordinary emergency measure and a long-term opportunity to establish a 'new normal' in HE: 'With increased pressures from both for-profit educational technology corporations and governments seeking to implement eLearning as a means of slashing education budgets, there is a sense of inevitability of efforts to normalize emergency eLearning' (Murphy 2020, p. 501).

11   Postsecondary Value Commission: https://www.postsecondaryvalue.org/
12   Collini, S. 2020, 31 August. English universities are in peril because of 10 years of calamitous reform. *The Guardian*: https://www.theguardian.com/commentisfree/2020/aug/31/english-universities-peril-10-years-calamitous-reform-higher-education
13   Marshman, I., Bare, E. and Beard, J. 2020, 28 September. As universities face losing 1 in 10 staff, COVID-driven cuts create 4 key risks. *The Conversation*: https://theconversation.com/as-universities-face-losing-1-in-10-staff-COVID-driven-cuts-create-4-key-risks-147007
14   Grady, J. 2020, 24 October. The government must support students stuck in Covid nightmare at universities. The Guardian: https://www.theguardian.com/commentisfree/2020/oct/24/the-government-must-support-students-stuck-in-covid-nightmare-at-universities
15   Gallagher, S. & Palmer, J. 2020, 29 Sep. The pandemic pushed universities online. The change was long overdue. *Harvard Business Review*: https://hbr.org/2020/09/the-pandemic-pushed-universities-online-the-change-was-long-overdue
16   Stokel-Walker, C. 2020, 15 October. Universities are using surveillance software to spy on students. *Wired*: https://www.wired.co.uk/article/university-COVID-learning-student-monitoring
17   Reich, J. 2020, 14 September. Edtech Mania is Back. *The Chronicle of Higher Education*: https://www.chronicle.com/article/ed-tech-mania-is-back

The economic imperative of emergency edtech

One key rationale for long-term investment in educational technologies for the post-pandemic recovery and improvement of education has been articulated in economic and geopolitical terms. Writing for the Organisation of Economic Cooperation and Development (OECD), educational economists from the US Hoover Institution have calculated the long-term national economic costs of 'learning losses' on 'human capital' development, and recommended enhanced use of 'digital learning technologies that adapt learning goals to the individuals' current achievement levels' as a key policy solution to improve educational performance and national economic growth.[18] Similarly, World Bank economists simulated the long term economic impacts of learning loss on earnings and productivity in countries worldwide, and, writing for the US think tank Brookings, argued that 'reimagined education systems' must enhance their technology-based instruction to promote 'personalized ways of providing education'.[19] These global calculations and simulations recast the effects of the pandemic on education in statistical economic and geopolitical terms as losses in individual earnings, human capital productivity, and governmental investment in education and students, and promoted personalised or individualised learning through digital technology as the priority policy solution to these long-term economic problems. This economic imperative is reflected in the UK government's announcement of £8million funding for 'digital skills bootcamps' and the launch of an online digital skills toolkit to 'boost productivity and help the country build back better from coronavirus', parts of its post-COVID reformatory plans to make 'higher education more flexible to facilitate lifelong learning, and to make it easy for adults and young people to break up their study into segments, transfer credits between colleges and universities, and enable more part-time study'.[20]

The promotion of technological solutions to the COVID-19 crisis is occurring across sectors and raising ethical challenges (Gasser et al, 2020), as part of 'a rise in disaster (techno-)capitalism' in which governments and large technology companies have begun 'experimenting in this state of exception' and 'governing through technology during the

18   Hanushek, E.C. and Woessman, L. 2020. The Economic Impacts of Learning Losses. Education Working Papers, No. 225. Paris: OECD Publishing, http://www.oecd.org/education/The-economic-impacts-of-coronavirus-COVID-19-learning-losses.pdf

19   Azevedo, J.P., Hasan, A., Geven, K., Goldemberg, D. and Aroob Iqbal, S. 2020, 30 July. Learning losses due to COVID-19 could add up to $10 trillion. Brookings: https://www.brookings.edu/blog/future-development/2020/07/30/learning-losses-due-to-COVID-19-could-add-up-to-10-trillion/

20   Prime Minister's Office. 2020, 29 September. Major expansion of post-18 education and training to level up and prepare workers for post-COVID economy. Gov.uk: https://www.gov.uk/government/news/major-expansion-of-post-18-education-and-training-to-level-up-and-prepare-workers-for-post-covid-economy

pandemic'.[21] Technology companies 'argue for increased experimentation, in part, because a return to normality is virtually impossible without the use of technology. Technological fixes can be uncritically adopted to facilitate the new circumstances of everyday activities such as studying and working' (Evangelista and Firmino 2020, p. 103). The rise of disaster technocapitalism is enabling the 'rapid acceleration' of commercial networked technologies 'into the realm of critical services such as health and education without democratic participation and oversight' (Yeung 2020, p. 55).

Private technology actors push for technological solutions, greater data collection and increased access for users, but 'when technology is presented as a scalable and efficient solution to complex social problems by governments, companies, or (more often than not) a combination of the two, there is little (if any) space to question the power structures and institutions that gave birth to these social problems in the first place' (Marda, 2020, p. 31). The role of technology companies in the emergency response to the pandemic has therefore amplified many existing problems of technology, 'including techno-solutionism; the frequent thinness of the legitimacy of technological intervention; excessive public attention on elaborate yet ineffective procedures in the absence of a nuanced political response; and the (re)production of power and information asymmetries through new applications of technology' (Taylor et al, 2020, p. 14).

HE is currently experiencing a state of emergency, exception and experimentation too, with private sector organisations and commercial technology proffered as policy solutions to the pandemic. This is both a short-term emergency strategy and, for some organisations, an exceptional long-term opportunity for experimentation with potentially profound consequences for the future of HE, raising sharp questions about whether future HE systems will be centred on concerns of educational purpose, technologically-measurable learning performance, private reformatory interests, or commercial profit advantage.

3. About this report

Our aim in this report is not to criticise the emergency response, or to take up a partisan position in relation to debates about campus reopening or the uptake of various modes of remote, flexible, hybrid or

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21   Sharma, G. & Martin, A. 2020, 21 August. Global Data Justice and COVID-19: Governing through technology during the pandemic. Data Active: https://data-activism.net/2020/08/bigdatasur-COVID-global-data-justice-and-COVID-19-governing-through-technology-during-the-pandemic/

'hyflex' education.[22] Online education in HE is neither a straightforwardly negative outcome of the pandemic nor obviously transformative (Bayne et al, 2020). We also recognise that HE systems prior to the pandemic were by no means 'innocent' in relation to such social problems as educational inequalities, and that commercialisation, privatisation and marketisation of education at all levels have long and contextually-situated histories pre-dating recent widespread digitalisation.[23] HE systems are extremely diverse, and their histories and practices of technology use are contextually situated: the pivot online was by no means experienced equally in different continental, national and local spaces, and the longer-term effects will be experienced differentially, in the context of specific historical and geopolitical factors, rather than evenly across territories.

We do, however, believe it is important to track key emerging developments in the ways private actors and commercial companies have sought to strengthen their role in HE during the specific context of the crisis (often framed and supported by public policymaking, international organisations, consultancies, think tanks and other sources of advocacy), and to identify how these efforts amplify existing pressures for HE system reform, innovation and transformation. Our work is informed by studies of 'policy mobility' - the recognition that policy is accomplished by organisations from many sectoral positions, not just governmental centres alone; that policy increasingly exhibits transnational reach; and that despite its globalising tendencies, policy plays out in context-specific ways (e.g. Lewis, 2020). As such, we treat the immediate pandemic privatisation and commercialisation of HE as a multi-sector global process involving diverse actors that criss-cross fields of government, business, consultancy and international governance, albeit unevenly across comparative contexts and temporal spans.

Informed by critical social science analyses of the production and effects of digital technology (e.g. Daniels, Gregory and Macmillan Cottom, 2017), we also aim to question 'techno-solutionist' ideals that digital technologies can ameliorate the complex problems faced by institutions and systems during COVID-19, and to challenge some of the long-term transformational or 'disruptive' proposals and plans that have followed.[24] Our interest primarily is in what private sector and commercial

22   Hodges, C., Moore, S., Lockee, B., Trust, T. and Bond, A. 2020, 27 March. The Difference Between Emergency Remote Teaching and Online Learning. *Educause Review*: https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning; EduCause Learning Initiative. 2020, 7 July. 7 Things You Should Know About the HyFlex Course Model. *EduCause*: https://library.educause.edu/resources/2020/7/7-things-you-should-know-about-the-hyflex-course-model

23   Watters, A. 2016, 14 June. Ed-Tech and the Commercialization of School. Hack Education: http://hackeducation.com/2016/06/14/commercialization

24   Molnar. P. 2020, 22 May. Borders, Politics, and Pandemics: The Risks of Technosolutionism in the Time of COVID-19. *Global Human Movement Review*: https://centreghum.com/2020/05/22/borders-politics-and-pandemics-the-risks-of-technosolutionism-in-the-time-of-COVID-19/

participation during the pandemic can tell us about how HE is being reimagined, reconfigured and reformed for a post-pandemic context. What might be the long-term consequences for institutions, staff and students, as well as the societies and economies they inhabit, resulting from the realisation and materialisation of those future visions of digitally-mediated and commercially-assisted colleges and universities? The report details key developments and case study exemplars as an initial response to such questions, with the aim of opening up important issues for further interrogation and discussion.

The geopolitics of regional responses

While many HE institutions around the world have responded to COVID-19 in similar ways - by closing campuses and pivoting to online and remote learning - the commercial players helping them do this are different. HolonIQ has recently released a list of the top 50 or 100 edtech companies across 6 global regions, including Sub-Saharan Africa, Russia and the Central Independent States, the Nordic-Baltic eight, Latin America, China and Southeast Asia.[25] These lists detail both the similarities and differences in regional edtech foci, where across regions, there is strong focus on Science, Technology, Engineering, Arts, and Maths (STEAM), coding, language learning, tutoring and test preparation and learning environments, but more variation in HE and workforce upskilling. On the surface this seems to be because edtech is more focused on the K-12 market in some regions. Indeed, geopolitical context is important to consider. In many African nations, 'analogue universities' were unable to adapt to online delivery due to issues of staff training, ICT infrastructure, student access, and even electricity supply.[26] For example, in Rwanda, HE institutions were ordered to close by the government for 7 months as there was limited technological infrastructure to support a pivot to online learning. This has left many HE providers in precarious financial positions with many staff unpaid during this period. It is important to consider the mobility and topology of edtech. It seems that edtech has been able to rapidly upscale only in the regions where it already existed, and thus, it has worked to enhance the digital divide between geopolitical regions. It also reflects the various ways in which different regional

25   HolonIQ Africa EdTech 50: https://www.holoniq.com/notes/holoniq-africa-edtech-50/;
      HolonIQ Russia and CIS EdTech 100: https://www.holoniq.com/notes/holoniq-russia-cis-edtech-100/;
      HolonIQ Nordic-Baltic EdTech 50: https://www.holoniq.com/notes/holoniq-nordic-baltic-edtech-50/;
      HolonIQ LATAM EdTech 100: https://www.holoniq.com/notes/latam-edtech-100/;
      HolonIQ China EdTech 100: https://www.holoniq.com/markets/edtech/holoniq-2020-china-edtech-100/;
      HolonIQ Southeast Asia Edtech 50: https://www.holoniq.com/notes/holoniq-southeast-asia-edtech-50/
26   Ismail, O. 2020, 5 June. COVID-19 & Africa: Analogue Higher Education, digital generation. King's College London: https://www.kcl.ac.uk/COVID-19-africa-analogue-higher-education-digital-generation

and national digital agendas support the development and uptake of digital technologies, and how they mediate the 'transnational private authority' and influence of corporate technology actors.[27]

The research documented in this report was conducted through detailed desk research, including web searches, background literature scans, and the close examination of websites, social media, and press coverage throughout August, September and October 2020. We began by cataloguing individual organisations offering products or services to support the use of educational technologies during the crisis, and identified a number of key categories that described these activities. These categories became the basis for the landscape mapping presented in section 3 of this report. Our aim is to provide a broad cartographical survey of the emerging landscape of commercialisation, privatisation and education technology in HE during the pandemic, noting key features, connections, and likely implications for processes and practices of HE in the short and long term.

While we understand the context of COVID-19 to be historically unique, many of the activities we have observed have a far longer temporal trajectory. The rapid digitalisation of many functions of HE during the pandemic is rooted in a series of transformations over the last two decades that have made HE more market-focused, more amenable to public-private partnerships, and more open to the participation of commercial organisations. The next section reviews key previous research on these transformations and their implications.

27   Hartmann, E. 2020, 17 September. Geopolitics goes viral: The digitalisation of the post-pandemic education landscape. The Post-Pandemic University: https://postpandemicuniversity.net/2020/09/17/geopolitics-goes-viral-the-digitalisation-of-the-post-pandemic-education-landscape/

Overview of Previous Relevant Research

1. Knowledge and data economies

The recent history of privatisation, commercialisation and digitalisation in HE is situated in longstanding debates about the role of education in societies and economies. In many countries since the 1980s and 90s, post-compulsory or postsecondary education has been positioned as a major part of national strategies to secure competitive international advantage in 'knowledge-based economies'. As political centres have calculated the economic importance of HE systems as producers of valuable knowledge under 'knowledge capitalism', HE institutions have been encouraged to develop links with industry and business through new venture partnerships and entrepreneurship, promoted by the development of new performance measures to establish and achieve targets (Olssen and Peters, 2007).

This model has changed subtly over the last decade as HE policies have begun adapting to the so-called 'data revolution' and the 'Fourth Industrial Revolution' of advanced computational technologies, big data analytics, and artificial intelligence.[28] The ideal of the knowledge-intensive university of the twentieth century - which conducted research to produce new knowledge, transmitted it through teaching, and created value for the knowledge economy - has gradually shifted to an ideal of the 'data-intensive' and 'digital-first university' of the twenty-first century that creates valuable new digital knowledge and develops digital data skills to support emerging capitalist data economies.[29]

2. Smart futures

The university of the Fourth Industrial Revolution - characterised variously as 'University 4.0' or the 'smart university' - has become the subject of feverish excitement amongst some commentators. Consultancy groups

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28   Schwaub, K. 2015, 12 December. The Fourth Industrial Revolution: what it means, how to respond. *Foreign Affairs*: https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution

29   Berry, D. 2020, 26 March. The idea of a digital-first university. Stunlaw: http://stunlaw.blogspot.com/2020/03/the-idea-of-digital-first-university.html

including Ernst and Young, McKinsey and Company, KPMG and Deloitte have all produced blueprint proposals for the future of universities that emphasise the potentially transformative effects of digital technologies and data use.[30] Digital and data-intensive smart universities, it has been claimed, are 'institutions that can use the huge amounts of data they generate to improve the student learning experience, enhance the research enterprise, support effective community outreach, and advance the campus's infrastructure' (Lane and Finsel, 2014, p. 4).

However, these ideals of the digital university favoured by policymakers and policy influencers also emphasise neoliberal logics of economics, efficiency, competition, audit, accounting, performance measurement, quality management, marketisation, commercialisation and privatisation (Selwyn, 2014). Processes of marketisation, privatisation and commercialisation of HE mean universities are increasingly focused on achieving market value through competition, performance ranking, consumer demand, and return on investment (Busch, 2016). Data and metrics such as performance rankings and accountability ratings have become driving 'engines' of HE, exerting powerful effects on how universities are evaluated and incentivising institutions to ensure they perform to meet the metrics (Espeland and Sauder, 2016). Universities have been encouraged to advance their use of digital infrastructures and platforms, particularly by 'unbundling' their services into component parts and exposing them to market forces for 'rebundling' by outsourced commercial companies as new digital products (McCowan, 2017).

3.   Global Higher Education Industry

As part of this shift to digital and data-intensive universities, a 'Global HE Industry' has expanded and mutated to include a range of digital providers and data services vendors (Komljenovic and Robertson, 2017). The Global HE Industry includes a vast array of businesses, consultancies, think tanks, investors and other private actors and commercial organisations, which together function to open up tertiary education to market processes. Combined, the Global HE Industry and processes of marketisation, privatisation and commercialisation underpin the

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30   Ernst and Young. 2018. Can the universities of today lead learning for tomorrow? The University of the Future. EY: https://www.ey.com/en_au/government-public-sector/can-the-universities-of-today-lead-learning-for-tomorrow;
McKinsey and Company. 2018. How higher-education institutions can transform themselves using advanced analytics. McKinsey: https://www.mckinsey.com/industries/public-and-social-sector/our-insights/how-higher-education-institutions-can-transform-themselves-using-advanced-analytics;
Deloitte. 2018. The impact of predictive analytics in higher education. Deloitte: https://www2.deloitte.com/us/en/pages/public-sector/articles/five-principles-for-improving-student-outcomes.html;
KPMG. 2019. Future-proofing the university. KPMG: https://home.kpmg/uk/en/home/insights/2019/02/future-proofing-the-university.html

emergence of powerful aspirations to modernise HE with technology, with myriad institutional tasks and functions delegated to digital platforms and data systems, supported by a diverse cross-sectoral array of 'arms length' HE agencies, think tanks, consultancies, private companies and coalitions (Williamson, 2019). Together, these organisations and technologies are making new digital markets for services and products in HE, which are in turn reshaping universities, colleges and the tertiary education sector itself to act in more market-like ways (Komljenovic and Robertson, 2016).

Commercial providers of digital technologies and data systems for HE have therefore become highly influential in the Global HE Industry. They include global education businesses such as Pearson, massive global technology companies including Amazon, Alibaba and Microsoft, education technology market intelligence agencies, investors in HE technologies, 'visionary' consultancies and think tanks, and a whole array of education technology vendors, startups and their platforms and services. The global industry of educational technologies and data services has grown to encompass every aspect or 'market segment' of HE activity, including: recruitment, enrolment and admissions services; student management systems; core digital infrastructure; management dashboards and analytics platforms; learning management systems and virtual learning environments; digital library and information services; elearning software and courseware; learning analytics; online assessment; plagiarism detection; graduate talent analytics, alumni and graduate relationship management; and more.[31]

4. Digitalisation and datafication

As educational technologies and data services have proliferated over the last decade, researchers have identified significant critical issues. These include emerging forms of digital exclusion and educational inequality, the growth of the education business and technology sectors as agenda-setting and policy-influencing forces in public education, and the increasing roles of commercial platform and infrastructure companies, artificial intelligence and machine learning in defining the future of education, teaching and learning (Selwyn et al, 2020). Educational digital technologies, including recent developments in online education, learning analytics, machine learning and AI, can promote positive developments towards academic improvement, equity, and enhanced forms of teaching

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31   Williamson, B. 2020. The Automatic University: A review of datafication and automation in higher education. University and Colleges Union Scotland: https://www.ucu.org.uk/media/10947/The-automatic-university/pdf/ucus_the_automatic-university_jun20.pdf

and learning (Bayne et al 2020). But educational technologies can also promote restrictive standardisation, excessive datafication, privatisation, and the deprofessionalisation of teaching.[32]

Many of these pressures are already being amplified by the response to COVID-19, as education systems have experienced increased digitalisation and datafication. The rapid recent digitalisation of all sectors is often associated with the belief that computers are always the solution to social problems, are more objective than human reason, and promise improvement wherever they are applied (Marres, 2017). However, as research has documented, the application of computers can sometimes make things more complicated, produce unintentional or harmful effects in the social systems where they are deployed, reflect the worldview of a narrow band of computer specialists, or serve the business interests of commercial companies over other needs (Broussard, 2018). These risks are amplified when digitalisation also enhances datafication, or the rendering of aspects of the world in measurable digital formats (Lupton, 2020). Datafication usually depends on (often for-profit) digital infrastructures for collecting, analysing and reporting data; on the specialized practices and assumptions of data analysts and engineers; and on algorithms that can condense the complexity and multiplicity of real world phenomena into perceptible forms and meanings, and thus make them amenable to subsequent action (Amoore, 2020). Together, digitalisation and datafication have been implicated in racial and gender-based forms of profiling, bias and discrimination, the reproduction and exacerbation of existing social and economic inequalities, the rise of extremist politics, widening political polarisation, and threats to rights, liberties, security and labour.[33]

Education has long been subject to historical forms of digitalisation and datafication, but the quantification, measurement, comparison, and evaluation of the performance of HE institutions, staff, students, and the sector through digital data systems is intensifying and expanding rapidly (Williamson, Bayne and Shay, 2020). For businesses in the global HE industry, digital data are a key source of market-making, both as universities seek out new technologies to help them measure and improve their performance at various levels, from the institution to the individual, and the companies utilise those data for product refinement and further development (Komljenovic, 2019). Digitalisation and datafication also introduce new market-based dynamics into HE

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32   We the Educators. 2017. Educational Technology and the Personalisation, Standardisation, Privatisation and Datafication of Education. Education International: https://issuu.com/educationinternational/docs/coor-124_wetheeducators-eng

33   See, for example: West, S.M., Whittaker, M. and Crawford, K. 2019. Discriminating Systems: Gender, Race and Power in AI. AI Now Institute: https://ainowinstitute.org/discriminatingsystems.html;
Nadler, A., Crain, M. and Donovan, J. 2018. Weaponizing the Digital Influence Machine: The Political Perils of Online Ad Tech. Data and Society: https://datasociety.net/library/weaponizing-the-digital-influence-machine/

and erode other values: by adopting 'commercial marketplace norms, these providers undermine core functions and values of education, which include promoting democracy, equal access to opportunity, and self-actualization as well as economic growth', and instead 'automate instruction, maximize data collection, and codify learning outcomes according to the limited parameters of data-defined metrics and credentials' (Zeide and Nissenbaum, 2018). The commercially programmed pedagogic environments introduced into HE during COVID-19 potentially stand to extend datafication and automation further through long-term hybrid arrangements of on-campus and online teaching and learning.

Longstanding pressures of HE marketisation, privatisation and commercialisation are now instantiated in and enacted by educational digital technologies and data systems weaving educational aims together with political aspirations to regulate HE in terms of its performance on multiple metrics and private sector ambitions to capitalise on emerging market opportunities (Williamson, 2019). This has been amplified by the response to COVID-19. The rest of this report is dedicated to examining how the COVID crisis has been utilised as an opportunity by private and commercial organisations and their supporters to reimagine HE as a digital-first, data-intensive sector, and to experiment in the construction of new kinds of campuses, colleges and universities.

Mapping Organisations and Activities

In this main substantive section we map private and commercial sector responses to the pandemic in HE, focusing especially on educational technology (edtech). We have been purposively selective in this exercise. It is not possible to capture the entirety of the edtech response to COVID-19. Instead, we have selected examples, discourses and issues that allow us to draw out key dynamics of HE marketisation, privatisation and commercialisation that have been reproduced or exacerbated by processes of increasing digitalisation and datafication. Throughout these cases we clearly evidence a growing demand for edtech solutions in HE to the COVID-19 pandemic and beyond.

1. Animating imaginaries

Important aspects of any intended technology-based transformation are the initial acts of imagination that set out the rationale and desired effects. Social theorists refer to 'sociotechnical imaginaries' as the visions of a future society, social life and social order that inspire and animate technical development (Jasanoff, 2015). Though sociotechnical imaginaries can originate from a single charismatic individual or organisation, their power to influence the direction of technical design, or the uptake of particular kinds of available technologies, comes when they become collectively held, institutionally stabilised and publicly performed as shared visions and objectives. At the present time, dominant imaginaries of digital, data-intensive futures circulating in the technology sector, the media, governments and popular culture alike are already becoming stabilised and normalised.[34] They transmit the values and ambitions of certain individuals and groups to others, attract coalitions of consensus, produce conviction that such visions are attainable, desirable and should be pursued, and animate actual technical development and digital practice - though of course not without considerable contestation from individuals and groups with alternative values and visions (Broussard, 2018).

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34   Ruppert, E. 2018. Sociotechnical Imaginaries of Different Data Futures. Erasmus University Rotterdam: http://research.gold.ac.uk/23570/1/Ruppert%202018.pdf

In the context of the emergency cancellation of face-to-face teaching and the closure of colleges, schools and campuses worldwide, a range of highly influential individuals and organisations began producing sociotechnical imaginaries and future visions of HE after the pandemic. 'Visionaries' of post-pandemic HE include consultancies, futurists, business leaders, international organisations, philanthropic foundations, and a range of science, business and media outlets. The international consultancies McKinsey, KPMG, Deloitte and Ernst Young all produced thought leadership, planning scenarios or guidance on HE during and after COVID-19. KPMG repurposed its 'future-proofing the university' framework for post-COVID recovery[35]; Ernst Young launched a report on 'how higher education institutions can navigate COVID-19 challenges'[36]; Deloitte developed a series of 'COVID-19 planning scenarios for higher education' and identified 'potential higher education opportunities'[37]; and McKinsey produced guidance on 'getting the next phase of remote learning right in higher education'.[38] These glossy reports aimed to frame the pandemic as an opportunity for transformations and reforms in HE that the consultancies have promoted for several years, and demonstrate how consultancies have positioned themselves as private providers of catalytic imaginaries, guidance and thought leadership in HE.

Global Higher Education consultancy imaginaries

Consultancy organisations are among the most influential producers of future scenarios and blueprints for the future of higher education. The consultancy firm Ernst & Young produced four scenarios for the future university, detailing the policy conditions, technical opportunities and institutional priorities required for each scenario:

Champion University
A hands-on government actively champions universities as strategic national assets. Most students enrol in traditional undergraduate and graduate degree programs. Universities streamline operations by transforming service delivery and administration.

35   Andrew, J. 2020, 24 September. Future-proofing the university. KPMG insights: https://home.kpmg/uk/en/home/insights/2019/02/future-proofing-the-university.html

36   Lytle, R. and Lundy, K. 2020, 4 April. How higher education institutions can navigate COVID-19 challenges. EY: https://www.ey.com/en_gl/strategy/how-higher-education-institutions-can-navigate-COVID-19-challenges

37   Deloitte Centre for Higher Education Excellence. 2020, May. Higher education remade by COVID-19: Scenarios for resilient leaders. Deloitte: https://www2.deloitte.com/us/en/pages/public-sector/articles/covid-19-higher-education-scenario-planning.html

38   Heitz, C., Laboissiere, M., Sanghvi, S. and Sarakatsannis, J. 2020, 23 April. Getting the next phase of remote learning right in higher education. McKinsey: https://www.mckinsey.com/industries/public-and-social-sector/our-insights/getting-the-next-phase-of-remote-learning-right-in-higher-education

Commercial University

A hands-off government requires universities to be financially independent to ease national budget pressures. Students favour degree programs that offer work-integrated learning. Universities reposition by drawing closer to industry to collaborate on teaching and research.

Disruptor University

A hands-off government deregulates the sector to drive competition and efficiency. Continuous learners and their preferences for on-demand micro-certificates dominate as technology disrupts the workplace. Universities expand into new markets and services and compete against a range of new local and global educational services providers.

Virtual University

An activist government restructures the tertiary sector to integrate universities and vocational institutes, prioritising training and employability outcomes as humans begin to be replaced by machines. Continuous learners are the majority, preferring unbundled courses delivered flexibly and online. Universities restructure into networks that share digital platforms.[39]

Business and media organisations sought to frame the emergency as a reformatory opportunity. The Economist Intelligence Unit in partnership with the Qatar Foundation, for example, launched the report 'New Schools of Thought: Innovative models for delivering higher education' detailing the need for HE to adapt to social, political, economic and technological challenges that became concentrated during the pandemic.[40] Likewise, coverage of 'How universities can embrace the post-COVID future' in the *New Statesman* specified the 'revolutionary' potential of digital technologies for 'long-overdue reforms':

A positive impact of the present pandemic on higher education is the sudden embracing of online conferences and teaching technology. Prior to the pandemic we had the technology for it to be different — it was there waiting for us — but not the impetus and will to use it. The consequences of this are potentially enormous. People all over the world can learn and teach to huge audiences at close to zero marginal cost. This will revolutionise the delivery of higher education and research and build on

39   Ernst & Young. 2018. Can the universities of today lead learning for tomorrow? The University of the Future. EY: https://www.ey.com/en_au/government-public-sector/can-the-universities-of-today-lead-learning-for-tomorrow
40   Economist Intelligence Unit. 2020. New Schools of Thought: Innovative models for delivering higher education. *The Economist*: https://pages.eiu.com/launch-folder_report-download-registration.html

the rise of 'massive open online courses' (MOOCs). But universities will need to undergo radical reform to turn this potential into actual gain.[41]

These examples indicate how a shared imaginary has begun to form around the long-term revolutionary potential of digital technologies to solve urgent social, financial and technological challenges now facing HE systems.

Policy-influencing international organisations have pushed this reformatory agenda further. The World Economic Forum, in its position as an 'international organization for public-private cooperation', published 'How COVID-19 is driving a long-overdue revolution in education', claiming that the 'global higher education market' is 'ripe for disruption' by commercial online learning providers. Its author, the Global Head of Education at the International Finance Corporation, a member organisation of the World Bank, argued that:

As painful and stressful a time as this is, it may fashion a long overdue and welcome rebirth of our education systems. ... COVID-19 is causing us to challenge deep-rooted notions of when, where, and how we deliver education, of the role of colleges and universities, the importance of lifelong learning, and the distinction we draw between traditional and non-traditional learners. ... Just as the First Industrial Revolution forged today's system of education, we can expect a different kind of educational model to emerge from COVID-19.[42]

Subsequently, the World Economic Forum published a series of articles produced both in-house and in collaboration with other media outlets, private companies and consultancies. One, a collaboration with *Quartz* magazine entitled 'History will look back on 2020 as a turning point for US universities', highlighted online degrees as both a huge market opportunity for commercial online learning providers and a source of fresh revenue for institutions, noting for-profit commercial online universities as a template for post-pandemic HE.[43]

Another World Economic Forum article, authored by the president of InfoSys Ltd, an Indian multinational information technology and outsourcing corporation, and the chief information officer of the consultancy Ernst Young, made the key argument that 'the future of work will not be about college degrees; it will be about job skills'. The COVID-19 pandemic and associated job losses, they argued, now make it

41   Dolton, P. 2020, 19 June. How universities can embrace the post-COVID future. *New Statesman*: https://www.newstatesman.com/spotlight/coronavirus/2020/06/how-universities-can-embrace-post-COVID-future-1

42   Kandri, S.-E. 2020, 12 May. How COVID-19 is driving a long-overdue revolution in education. World Economic Forum: https://www.weforum.org/agenda/2020/05/how-covid-19-is-sparking-a-revolution-in-higher-education/

43   Staley, O. 2020, 27 August. History will look back on 2020 as a turning point for US universities. World Economic Forum: https://www.weforum.org/agenda/2020/08/covid19-digital-college-courses-united-states-us/

imperative to focus on 'digital jobs' for the 'data and AI economy' as well as for specific roles in technical domains such as cloud computing and engineering. Their proposed solution is 'always-on skills-based education and employment infrastructure', based on digital learning platforms, 'that embraces not just credentials and certification but fitness-for-job and employment as outcomes'.[44]

A set of shared ideals for post-pandemic HE run through the many articles published by the World Economic Forum: enhanced use of digital technologies; the development of job-ready skills for the digital economy; the cultivation of competencies in remote working, creativity and collaboration; and the increased involvement of private sector providers and commercial technology companies in the provision and delivery of teaching and learning. These aspects of a post-pandemic educational imaginary reinforce the World Economic Forum's 'Education 4.0' and 'Reskilling Revolution' initiatives on transforming education systems for the 'Fourth Industrial Revolution', announced just prior to the pandemic as parts of its ambitious global 'Shaping the Future of the New Economy and Society' program.[45]

For other visionaries, however, the post-COVID college or university and the role of the teacher may need transforming even more radically. The Senior Futurist of the DaVinci Institute, for example, argued that the 'chaos' of campus closures brought 'great opportunities' to 'hyper-individualise education' with artificial intelligence:

> *In practice, hyper-individualising education translates into a human-to-AI interface that monitors the student and learns about them until it knows what the student is proficient in and what they still need to learn. Based on this, the AI teacher bot will determine what the student needs to learn. It feeds the student information in a bite-size format based on what it knows about the most optimal times and ways to learn different kinds of information to each individual, personally.[46]*

In this imaginary, the teacher function is performed by AI, and learners experience increasingly automated instruction and accelerated learning. The article was published by Futures Platform, a 'strategic foresight' group that also offers pay-for AI-driven 'futurism' services and guidance for the HE sector as part of its 'The World After COVID-19' program. One

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44   Kumar, R. and George, S. 2020, 21 September. Why skills - not degrees - will shape the future of work. World Economic Forum: https://www.weforum.org/agenda/2020/09/reckoning-for-skills/

45   World Economic Forum 'Education 4.0' initiative: https://www.weforum.org/projects/learning-4-0;
      World Economic Forum 'Reskilling Revolution Platform': https://www.weforum.org/projects/reskilling-revolution-platform;
      World Economic Forum 'Shaping the Future of the New Economy and Society' program: https://www.weforum.org/platforms/shaping-the-future-of-the-new-economy-and-society

46   Veltheim, H. 2020, 1 June. Future of education after COVID-19: AI becomes the teacher while humans mentor and coach. Futures Platform: https://www.futuresplatform.com/blog/future-education-after-COVID-19-ai-becomes-teacher-while-humans-mentor-and-coach

of its scenarios is that 'schools may become mega-corporations that offer entirely personalized study packages where the learners could choose the content, pace, learning style and tools... This would, in turn, cause public institutions to lose value, and could even render the lengthy university degrees obsolete'.[47]

The idea of the future university as a mega corporation was popularised during the pandemic in 2020 by Scott Galloway, a former technology entrepreneur and latterly business school professor in New York, and the widespread media coverage it received. His speculations on 'post-corona higher education' included predictions that prestigious HE institutions would partner with big tech companies, such as MIT with Google, Carnegie Mellon with Amazon, UCLA with Netflix, and Berkeley with Microsoft, in order 'to offer 80% of a traditional four-year degree for 50% of the price', while hundreds of other institutions will go bankrupt.[48] The prediction 'post-corona' HE would involve tech companies providing digital infrastructure and industry expertise and their university partners providing the accreditation, was boosted considerably by extensive media coverage with headlines including 'elite cyborg universities will soon monopolize higher education'.[49] Galloway has also established his own startup for HE, Section4, offering intensive online courses that are 'immediately applicable at work' as affordable alternatives to expensive business school degrees.[50]

The dominant sociotechnical imaginary of HE emerging during the pandemic is characterised by:

- increasing public-private partnerships between public institutions and private technology providers;
- 'unbundling' of teaching and learning to the programmed pedagogic environments provided by digital platforms and services;
- increasing use of 'smart' technologies for 'hyper-individualised' personalised learning;
- aligning education with employability through fast-track affordable online alternatives to degrees.

Running through these key characteristics is the underlying assumption that the HE sector should and must adapt to changing social and

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47 Sandal, G. 2020, 6 August. Strategic Foresight in Education Planning: A Guideline. Futures Platform: https://www.futuresplatform.com/blog/strategic-foresight-education-planning-guideline

48 alloway, S. 2020, 3 April. Post-corona: Higher Education. ProfGalloway.com: https://www.profgalloway.com/post-corona-higher-ed

49 Walsh, J.D. 2020, 11 May. The Coming Disruption Scott Galloway predicts a handful of elite cyborg universities will soon monopolize higher education. *The Intelligencer, New York Magazine*: https://nymag.com/intelligencer/2020/05/scott-galloway-future-of-college.html

50 Harris, A. 2020, 29 September. Scott Galloway pivots to stardom. *Fast Company*: https://www.fastcompany.com/90451794/scott-galloway-pivots-to-stardom

technological contexts, and that technical solutions from industry offer the best means of doing so - either directly as products or less directly as 'templates' for rethinking HE practices. As a recent example in the *Times Higher Education* put it, there are valuable lessons for universities in understanding how Amazon and Netflix use customer data to improve user experience. This would entail 'building tighter feedback loops and letting student feedback more drastically shape institutional design', being 'more data/user informed', 'making continuous and speedy user-informed improvements' and cultivating a culture of institutional experimentation'.[51] In this example, the key web platforms of the digital economy are treated as exemplary sources of inspiration for HE modernisation.

Overall, the imaginary of a more digital and data-intensive HE sector has become increasingly shared and stabilised, as influential organisations and charismatic individuals have sought consensus not just on emergency measures but long-term aspirations to transform HE. Nick Hillman of the UK's Higher Education Policy Institute has described many 'revolutionary' predictions about HE after COVID-19 as 'exceptionally vague' and 'unoriginal', and while suggesting many of them are unlikely to materialise, he acknowledges significant signs of HE restructuring, including mergers between non- and for-profit providers, and further hybridisation of on-campus and online teaching.[52] Rather than appearing in their 'idealised' form, imaginaries materialise in context-specific, partial and contingent ways. Many of the visions documented above are also reflected in edtech markets, with private capital positioned as a key force for realising high-tech HE imaginaries.

2. Market catalysts

Over the last decade, venture capital and other forms of investment in educational technologies have grown significantly as companies and investors have sought to transform imaginaries of educational transformation into reality through product development funding (Santori, Ball and Junemann 2016). Edtech has become a significant multibillion dollar market segment of a larger global education market now valued, according to market intelligence agencies, at US$6trillion.[53] The reported growth of edtech spending by the education sector, and associated growth of private capital sources of investment, is

51   O'Connor, M. 2020, 30 August. Higher education needs a user experience overhaul. *Times Higher Education*: https://www.timeshighereducation.com/blog/higher-education-needs-user-experience-overhaul

52   Hillman, N. 2020,16 October. The Future of Higher Education After COVID. HEPI: https://www.hepi.ac.uk/2020/10/16/the-future-of-higher-education-after-COVID/

53   HolonIQ. 2019, 30 January. 10 charts that explain the Global Education Technology Market. HolonIQ: https://www.holoniq.com/edtech/10-charts-that-explain-the-global-education-technology-market/

an economic and material reflection of the dominant sociotechnical imaginary that sees education as being in need of modernisation and transformation with digital technology. Private capital is understood as essential to achieving this vision. The investment information platform Crunchbase, for example, includes a specific database of companies 'Leading Edtech through COVID-19'.[54] In this section we examine some of the key ways in which COVID-19 campus closures have been treated as catalytic market opportunities for investors to profit from the expansion of private and commercial edtech in HE.[55]

'COVID-19 is a powerful catalyst for EdTech' stated investment fund managers at Credit Suisse, a global wealth management, investment and financial services firm, in the preface to a detailed report about investment opportunities in edtech during 'coronavirus and beyond':[56]

> *There are tremendous opportunities to invest into EdTech, with strong growth in both venture capital and listed equity. The Coronavirus pandemic will accelerate investment, with many EdTech companies bringing forward investments into new functionalities. This investment will only continue, as educators and administrators recognise that many of these applications are more effective than traditional learning models. ... With the extra resources, and a vast population of educators and students who are now much more open to digital learning, EdTech will transform education as we knew it.[57]*

The report acts in part as a marketing brochure for the The Credit Suisse (Lux) Edutainment Equity Fund, an investment fund that 'offers investors pure-play exposure to an attractive long-term theme in an early stage of development', and which 'aims to achieve long-term capital growth by investing in innovative companies whose products and services are designed to disrupt the traditional approach to education'.[58] The Credit Suisse Edutainment fund, which its managers claim is the largest equity fund focusing on edtech in the world, exemplifies the ways that edtech investment markets are constructed both to return profit to investors andt to actively 'disrupt' and 'transform' the public institution of education itself. Credit Suisse even sponsored content on the *Financial Times* website, producing themed copy on 'Edtech's Bright Future' with headlines including 'Education is having its Netflix moment as a result

54   Crunchbase 'Leading Edtech through COVID19' database: https://www.crunchbase.com/lists/leading-edtech-through-COVID-19/81ad5c7e-a855-4352-bc58-f48df321d3fd/organization.companies
55   Mascarenhas, N. 2020, 20 July. 'Edtech is no longer optional': Investors' deep dive into the future of the market. *TechCrunch*: https://techcrunch.com/2020/07/20/edtech-is-no-longer-optional-investors-deep-dive-into-the-future-of-the-market/
56   Pyshkin, K. and Gifford, J. 2020, 6 July. COVID-19 is a powerful catalyst for EdTech. Credit Suisse news and insights: https://www.credit-suisse.com/uk/en/articles/asset-management/COVID-19-is-a-powerful-catalyst-for-edtech-uk-202007.html
57   Gifford, J. and Pyshkin, K. 2020. Education Technology: Coronavirus and beyond. Credit Suisse: https://www.credit-suisse.com/media/assets/microsite/docs/responsibleinvesting/cs-education-technology-spread.pdf
58   Credit Suisse. 2019. Digital transformation of education: Credit Suisse (Lux) Edutainment Equity Fund. Credit Suisse: https://www.credit-suisse.com/pwp/am/downloads/marketing/br_lu2022170018_uk_csam_en_web.pdf

of the coronavirus pandemic' and 'Disruption With Honours: Higher Education's EdTech Revolution'.[59]

The revolutionary disruptions envisaged by investment companies emphasise increasing hybridity of online and on-campus learning, AI, data analytics and personalisation - that is, they aim to materialise edtech imaginaries in market dynamics. The edtech fund manager from Goldman Sachs, the American multinational investment bank and financial services company, stated at the outset of the pandemic that 'COVID-19 could sharply accelerate the adoption of online learning in higher education'. He added, 'long-term investors' are 'approaching edtech as an asset allocation category' with specific interests in 'data analytics, machine learning and artificial intelligence' and 'learning assessments' that provide 'rich, personalized data that show each student's entire performance profile, complete with their challenges and focus areas'.[60]

Edtech index investing

A significant investment development during the pandemic was the launch of two edtech-themed 'exchange traded funds' (ETF). Part of a family of financial instruments known as 'index investing', exchange traded funds are 'baskets' of shares in a collection of companies - representing a particular 'theme' or 'trend' - which fluctuate with the market. The Global X edtech fund launched in July 2020 focused on online learning and MOOC providers ('Education-as-a-Service'), and artificial intelligence that 'can leverage machine learning to understand students' individual needs' and adaptively 'personalise' their learning experiences, as well as optimizing teaching: 'We can already see mass-implementation of such technology in China and are starting to see less sophisticated rollouts of it in the US. By 2025, global AI-EdTech expenditure is projected to reach $6B'.[61]

Likewise, the Rize edtech ETF launched in September 2020 aimed to invest in 'digital learning technologies can help elevate the education sector into the 21st century.' In the context of 'unprecedented automation, reskilling and upskilling have never been more vital', its asset managers argued, proposing that 'advanced technologies' and 'personalised and adaptive learning allow education to be tailored to people's needs as they move through their lifecycles'.[62] A key partner in the Rize ETF is HolonIQ, an international edtech market

59   Financial Times/Credit Suisse. Edtech's Bright Future: https://www.ft.com/paidpost/credit-suisse/edtechs-bright-future.html
60   Goldman Sachs. 2020, 17 March. How Coronavirus Is Reshaping Classroom Learning. Goldman Sachs insights: https://www.goldmansachs.com/insights/pages/from_briefings_17-mar-2020.html
61   Global X Education ETF: https://www.globalxetfs.com/introducing-the-global-x-education-etf-edut/
62   Rize LERN ETF: https://rizeetf.com/funds/education-tech-and-digital-learning/

intelligence organisation headquartered in Sydney, Australia, which uses machine learning and advanced data visualisations to identify 'organizations, capital, talent, research and analysis that are powering the future of learning'.[63] During the COVID pandemic, HolonIQ estimated the total value of the edtech sector at $404bn by 2025.[64] It also produced a 'Global Learning Landscape' summary of hundreds of companies that it saw as transformative in the education sector,[65] and a 'Higher Education Digital Capability Framework' to support HE institutions to identify digital improvement strategies.[66] By partnering with Rize as the 'thematic expert' on its fund, HolonIQ shifted from cataloguing and forecasting edtech markets to being an active agent and catalyst of market growth. Its Global Learning Landscape became the basis for the index underpinning the Rize ETF, shaping and guiding financial investment in the future of edtech, while its Digital Capability Framework aimed to steer HE institutions to invest in digital transformation.

The surging interest in edtech as a site of investment during COVID-19 highlights how education during and beyond the pandemic has been framed as a sector for disruption and profit-making. Investment and asset managers have become important educational actors, helping to popularise the imaginary of AI-centred hybrid, lifelong and personalised learning, emphasising 'upskilling' for employability, and highlighting the role of private capital and commercial technology companies in the digital transformation of HE. They attract investors to this imaginary as a way of catalysing market growth and to inject capital back into edtech companies and further product development. In this way, financial actors and instruments tangibly intervene in education systems to change them to fit the preferred profitable model. By October 2020, the edtech market intelligence agency HolonIQ calculated that $8.3billion in venture capital had been invested in edtech in the first three quarters of 2020 alone, 'setting the sector up for a record-setting full year'.[67]

63   HolonIQ: https://www.holoniq.com/
64   HolonIQ. 2020, 6 August. Global EdTech Market to reach $404B by 2025 - 16.3% CAGR. HolonIQ: https://www.holoniq.com/notes/global-education-technology-market-to-reach-404b-by-2025/
65   HolonIQ. 2020, 17 July.The 2021 Global Learning Landscape. HolonIQ: https://www.holoniq.com/notes/the-2021-global-learning-landscape.-an-open-source-taxonomy-to-map-the-future-of-education/
66   HolonIQ. 2020. Higher Education Digital Capability Framework. HolonIQ: https://www.digitalcapability.org/
67   HolonIQ. 2020, 8 October. $8.3B Global EdTech Venture Capital after Q3 2020. HolonIQ: https://www.holoniq.com/notes/8.3b-global-edtech-venture-capital-after-q3-2020

3. Learning management and experience platforms

Learning management systems (LMS) are one of the most widespread and financially lucrative forms of educational technology in HE. LMSs act as digital infrastructure to host courses, store materials, record student participation in learning, and report information. They can be understood as programmed pedagogic environments that shape, delimit or constrain the possibilities of teaching and learning. As colleges and universities moved to online remote teaching and learning, LMSs have taken on an enhanced infrastructural role, moving from a background position to being a dominant medium through which institutions, staff and students interact. Even prior to the pandemic, the LMS market was vast, estimated at over US $9 billion in 2019 and expected to grow by about 20% per year to $30 billion by 2025, according to some forecasts.[68] LMS providers also, importantly, have sought to enhance the use of data analytics in HE, amassed huge datasets of student information, and built interoperable integrations with third-party platform plug-ins to enable data mining at scale from the increasing participation of students in digitally-mediated education.

The three market leaders in the LMS sector are Blackboard, Moodle and Canvas, and all three sought to position themselves as emergency response platforms for HE during COVID-19, with analysts forecasting the LMS market accelerating as a result of the pandemic.[69]

Blackboard, for example, is a long-established commercial LMS with a large global presence in HE as well as the schools sector. It consists of the Blackboard Learn platform for learning management, a videoconferencing/virtual classroom service, a mobile app, a suite of data analytics, and interoperability functionality for integration with hundreds of authorised third party platforms and apps - from Google and Microsoft products to online learning services and materials from edtech suppliers and international education businesses such as Pearson.[70] Blackboard reported a 100% increase in its active user numbers in March 2020, a '3,600 percent surge in daily global usage' and '25 billion weekly interactions', requiring it to extend its existing partnership with Amazon Web Services (AWS) for cloud infrastructure, enhanced usage data visualisations and AI functionality.[71] In tandem with its expanding scale of operations, upgrades, product service offerings and provision of online

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68   Valuates Reports. 2020, 14 April. Learning Management System (LMS) Market Size is Expected to Reach USD 29.901 Billion by 2025. PR Newswire: https://www.prnewswire.com/news-releases/learning-management-system-lms-market-size-is-expected-to-reach-usd-29-901-billion-by-2025---valuates-reports-301040270.html

69   Hill, P. 2020, 12 August. State of Higher Ed LMS Market for US and Canada: Mid-Year 2020 Edition. PhilOnEdTech: https://philonedtech.com/state-of-higher-ed-lms-market-for-us-and-canada-mid-year-2020-edition/

70   Blackboard Higher Education: https://www.blackboard.com/industries/higher-education

71   Vieira, K. 2020, 24 August. Why We Work With AWS. Blackboard Blog: https://blog.blackboard.com/why-we-partner-with-aws/

training courses during the pandemic, Blackboard also offered regular thought leadership blog posts on remote education and virtual teaching, including promoting the use of AI, data and predictive analytics.[72] Much of its activity during COVID-19 reflected Blackboard's pre-existing efforts to animate digital innovation in HE to grow its role as a source of leadership on the future of education.[73] Blackboard describes its data analytics service Blackboard Intelligence as a 'Single Source of Truth' that provides a '360° view of Institutional Performance and Student Success'.[74]

Data analytics in learning management systems

LMS providers claim to own some of the most extensive student datasets on the planet, and the capacity to improve processes and practices of teaching and learning through data is one of their key marketing claims. These claims include:

Canvas: 'Canvas Analytics provides key stakeholders—including instructors, admins, students, and even parents for K–12—easy-to-read, actionable information on the progress and success of students, programs, and institutions. Analytics adds personalized user dashboards that track performance. Students can check their own progress. Teachers can monitor their classes. Administrators can analyze programs. And all data can be easily exported through the API for custom data crunching.'

Blackboard: 'To accelerate the pace of high quality post-secondary degree production, institutions need a way to gain a holistic perspective that minimizes complexity and surfaces actionable insights from the mountains of data they already have. ... Blackboard Intelligence is a complete suite of data management, performance dashboard, and reporting solutions to help you understand and optimize every dimension of your college or university.'

Moodle: 'Learning analytics and elearning reporting offer insights into the progress of learners and ensure that objectives are being met. Viewing trends of participation, submissions and other data can assist educators improve the elearning experience, vastly helping retention rates and student successes.'

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72   Blackboard 'Scaling Teaching and Learning Online in Response to COVID-19' site:.
      https://www.blackboard.com/go/scale-teaching-and-learning-online
73   Blackboard. 2020, 3 February. Perspectives on the Future of Education: Ed Leaders Weigh-In, Part 9. Blackboard Blog:
      https://blog.blackboard.com/perspectives-on-the-future-of-education-ed-leaders-weigh-in-part-9/
74   Blackboard Intelligence Student Analytics:
      https://www.blackboard.com/teaching-learning/data-and-analytics/blackboard-intelligence

The main commercial competitor to Blackboard, Canvas, an LMS owned by Instructure,[75] offers a similar suite of learning management, virtual learning and data analytics services, as well as interoperable integrations with over 400 edtech partners allowing 'third-party apps to plug right into Canvas, pull from its data, and push data back in'.[76] A cloud-based platform, Canvas partnered with Amazon AWS in 2015 to provide data storage, scalability, and enhanced dataflows between the platform and its third-party plug-ins. Its analytics suite is especially significant, as claims by its chief executive about the potential 'monetization' of the data by developing predictive analytics was a key part of its pitch to investors in 2019, a process which culminated in a $2billion private equity acquisition completed in spring 2020.[77] At the outset of campus closures, Canvas began offering free subscriptions for limited functionality of the platform, and, like Blackboard, also positioned itself as a thought leader in remote and distance education across schooling and HE sectors, providing an extensive series of advice and guidance reports, videos, webinars and other practical resources.[78] However, its reliance on AWS and its range of third-party integrations makes Canvas into one of the most data-extractive organisations in the higher education sector, with its emphasis on mobilising AI and machine learning to monetise student data, and its private equity acquisition in 2020, raising concerns about the consequences of 'longitudinal surveillance' and the vulnerability of student data to exploitation in private markets (Marachi and Quill 2020).

The main alternative to the commercial Canvas and Blackboard platforms is Moodle, an open source LMS with free-to-use options that also experienced huge growth during the initial wave of the pandemic, supported partly by its membership of the Global Education Coalition established by UNESCO in April 2020.[79] Approximately 50,000 new Moodle sites were added in the following months, with millions of reported new users accessing Moodle through either registered sites or its mobile app. These increased user numbers and activities, twinned with those of Blackboard and Canvas, demonstrate the swiftness with which LMS providers responded to campus closures in order to support emergency remote education. They rapidly upgraded their platforms and services to respond to demand, but also utilised opportunities to position themselves as long-term infrastructures for transformative digital and

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75   Instructure. Canvas for Higher Education: https://www.instructure.com/canvas/en-gb/higher-ed
76   Instructure. Canvas: The home of student success:
      https://www.instructure.com/canvas/higher-education/empowering-faculty/improving-learning
77   Hill, P. 2019, 11 March. Instructure: Plans to expand beyond Canvas LMS into machine learning and AI. *Eliterate*:
      https://eliterate.us/instructure-plans-to-expand-beyond-canvas-lms-into-machine-learning-and-ai/
78   Instructure. Tools for Effective Instructional Continuity:
      https://www.instructure.com/canvas/tools-for-online-learning-when-the-classroom-closes
79   Moodle. The impact of COVID-19 on online learning. Moodle: https://moodle.com/COVID19/

data-intensive models of 'hybrid' or 'blended' teaching 'in a dramatically altered learning environment'.[80]

'Learning Experience Platform' (LXP) expansion during COVID

Originating in the corporate training and enterprise learning and development sector, the key feature of an LXP is that it is designed to automate the 'intelligent discovery' and 'recommendation' of relevant learning content. Whereas conventional LMSs are based on centrally-administered searchable course catalogues, an LXP is organized more like YouTube or Netflix as a content aggregation and management platform with in-built personalised recommendation technologies. An LXP collects continuous data from learners' behaviour, learning and performance in order to perform these analytics and personalised recommendation processes. The Aula LXP for HE, used by multiple HE providers across the UK, presents itself as a 'digital campus' platform that partners with academics 'to design high quality learning experiences', which it terms 'Dream Courses', and to 'scaffold the shift to blended and fully online' teaching.[81] Like other LMSs, Aula integrates with multiple third-party platform and app plug-ins, its 'LMS Data Importer' automates the migration of all content and information from other systems, and the platform monitors real-time student engagement to offer educators personalized recommendations for improvement.[82] Aula promoted its LXP model as a solution to universities' needs to develop online learning experiences during the pandemic, and as a model for flexible 'hybrid delivery' in a transformed HE sector.[83]

LMS platforms have begun exceeding their original role as background digital infrastructure to become core teaching technology and 'thought leaders' in innovative pedagogy and curriculum design. They are increasingly seeking to act as providers of online learning scaffolding and pedagogic environments, as 'recommendation engines' for AI-enhanced 'personalised learning', and 'digital campus', 'learning design' or 'dream course' developers, utilizing their extensive and continuously updated data sets for teaching innovation, institutional outcomes enhancement,

80   Wan, T. 2020, 2 October. When the Pandemic Hit, Edtech Companies Threw Out Their Roadmaps and Changed Course. EdSurge: https://www.edsurge.com/news/2020-10-02-when-the-pandemic-hit-edtech-companies-threw-out-their-roadmaps-and-changed-course

81   AULA. How it works: https://aula.education/how-it-works.html

82   Krohn, A. 2019, 19 February. We need to talk about capacity. Aula blog: https://blog.aula.education/we-need-to-talk-about-capacity-9ad800734904

83   Krohn, A. 2020, 8 May. How do we make digital learning work consistently for every course in the institution? Aula blog: https://blog.aula.education/how-do-we-make-digital-learning-work-consistently-for-every-course-in-the-institution-da5e668733fa

and measurable performance improvement. The market leaders, Blackboard and Canvas, are also partnered with Amazon Web Services for data storage and analytics capacity, ultimately enabling AWS to penetrate the HE market through mundane back-end cloud infrastructure and services. LMS platforms are likely to become even more central to HE teaching with the ongoing shift to online and hybrid format degree provision. This also brings new sources of expertise into the design of education, reframing it as 'hybrid' learning experiences that are enabled by 'learning design' and the pedagogic capacities and constraints that technology affords.

4. Return of the MOOC

Online learning platforms have become central to the operations of colleges and universities worldwide with the closure of campuses and the cancellation of face-to-face teaching. Although LMS platforms, as detailed previously, have been mobilised for online teaching, specific product categories such as massive open online courses (MOOCs) and online program management (OPM) platforms have become especially attractive to institutions seeking ways to deliver courses remotely, and to edtech investors seeking profitable returns from the pandemic. Online learning was already a major area of market growth prior to COVID-19, with providers reporting a huge surge in demand with the onset of the pandemic. These online learning platforms are programmed pedagogic environments that mix together the capacities of social media, networking and data processing technologies with demands for universities to make their course offers more accessible to nontraditional or international students.

Interest in MOOCs first peaked in 2012 as universities were attracted to the model of offering free or low-cost courses at huge scale and reach to nontraditional students, with US-based providers such as Udacity, edX, and Coursera effectively blending online teaching and social media into an investor-friendly model of disruptive education.[84] Udacity later announced its 'nanodegrees' program in key technology and business subjects (such as AI, data science, and programming), allowing students temporary free access, followed by paid-for courses, as a modular alternative to conventional on-campus routes to a degree. Although initial hype later slumped, as industry and investor marketing contrasted with

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84   Pappano, L. 2012, 2 November. The Year of the MOOC. *New York Times*: https://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html

weak completion and pass rates,[85] with the onset of campus closures in 2020, enrollment in Coursera MOOCs grew from 1.6 to 10.3 million - 640% higher from mid-March to mid-April than the same period in the previous year - while enrollment at Udemy increased 400% between February and March.[86]

As well as offering conventional MOOCs with university partners, MOOC providers also accelerated their diversification into the provision of platform services to replace cancelled in-person courses. As the largest provider in the online learning market, Coursera, for example, launched C4C (Coursera For Campus) in 2019, and as part of its 'Coronavirus Response Initiative' in 2020 began offering universities bulk licenses at no cost, enabling students to enroll on courses to earn credits towards their degree.[87] During the pandemic, it also launched three new services: Coursera for Students to provide free access to content on Coursera for college and university students around the world; CourseMatch, a service mapping on-campus courses with equivalent Coursera courses and enabling students to enrol on MOOCs as an alternative to cancelled classes; and Live2Coursera service integrating Zoom lecture recordings into private or open courses.[88] The International Finance Corporation, part of the World Bank Group, published a detailed case study of Coursera, entitled 'Supporting the Digital Transformation of Higher Education to Increase Access'. It praised Coursera as a model of 'revolutionary innovation' and a 'Three-Sided Platform Ecosystem' servicing learners, educators and employers that 'generates network effects, or improvements to the value of the service that is generated because of the increased number of participants on the platform'.[89] According to Coursera's chief product officer, 'While universities needed to quickly go online due to the disruption from COVID-19, this is also a catalyst for the digital transformation of higher education,' which it sought to lead through the integration of machine learning to 'track' student progress, 'personalise' their experience, and provide 'AI-powered nudges to help learners stay on track'.[90]

85   Robinson, D. 2016, 14 July. MOOCs: Tsunami to ripple. Worlds of Education blog: https://www.worldsofeducation.org/en/woe_homepage/woe_detail/4872/moocs-from-tsunami-to-ripple

86   Impey, C. 2020, 23 July. Massive online open courses see exponential growth during COVID-19 pandemic. *The Conversation*: https://theconversation.com/massive-online-open-courses-see-exponential-growth-during-COVID-19-pandemic-141859

87   Coursera for Campus: https://www.coursera.org/campus/

88   Coursera CourseMatch: https://www.coursera.org/campus-coursematch

89   IFC. 2020, 6 May. Supporting the Digital Transformation of Higher Education to Increase Access. IFC: https://www.ifc.org/wps/wcm/connect/3041eb88-e5dd-43d0-aab9-11cff1742db6/IFC-CourseraCaseStudy-May2020.pdf?MOD=AJPERES&CVID=n83-Doo

90   Goli, S. 2020, 21 April. Introducing New Tools and Features as Demand for Online Learning Grows. Coursera blog: https://blog.coursera.org/introducing-new-platform-innovations-as-demand-for-online-learning-grows

AI and the MOOC

Cousera announced a range of AI and machine learning features to support students' remote learning during the pandemic, with updates to its digital pedagogic environment including:

PERSONALISED BROWSING – Built on machine learning models, this feature ensures learners receive tailored suggestions for the most relevant learning content based on their learning journey so far.

PERSONALISED HOMEPAGE – When logged in, learners can resume a course in one click, see personalized recommendations on courses to pursue next, and view the certificates they've earned so far.

SMART REVIEW MATERIAL – This machine learning tool helps unblock learners when they fail a quiz. It serves targeted review material recommendations based on the specific questions they missed, providing learners with a structured path to succeed on the next quiz attempt.

LEARNER SKILL TRACKING – This data-driven tool tracks learner skill development, sharing updated competency scores as a learner takes more assessments on Coursera. Through a centralized dashboard, learners can monitor their progress toward career-specific skills and see how their competency scores compare to other professionals on the Coursera platform.

No doubt wary of their initial failure to live up to the 2012 'Year of the MOOC' hype, providers have sought to produce evidence of their impact during the pandemic, as a way of demonstrating their long-term potential in terms of upskilling students, promoting workforce recovery, and supporting sectoral transformation. In September 2020, Coursera released its first-ever 'impact report' detailing its response to the COVID-19 pandemic. On its release, Coursera's chief executive claimed:

how the world learns is dramatically changing. Students globally are seeking high-quality online learning options. Universities are ushering in a new era of digital transformation. Workers are learning job-relevant skills to stay competitive. ... Together with our partners, we launched a number of initiatives to help learners and institutions every step of the way, providing them with access to free content, job-relevant skills, and many resources on Coursera. What started as a short-term response to a crisis will result in a long-term digital transformation of higher education.[91]

91   Maggioncalda, J. 2020, 23 September. Announcing Coursera's First Impact Report. Coursera blog: https://blog.coursera.org/announcing-courseras-first-impact-report/

The report detailed huge global growth for Coursera, especially in south Asia, partnerships with 150 HE institutions around the world, as well as 50 industry partners offering 580 courses (including Google, IBM, Facebook, AWS, Alibaba Cloud, Intel and Salesforce). It also quantified the impact of its Coursera for Campus service, reportedly reaching 3,700 campuses and 2.4 million campus learners worldwide. Finally, Coursera released its Drivers of Quality in Online Learning Report, using 'eight years of learner data and nearly 200 million course enrollments to provide actionable, data-driven insights into how instructors and learners can optimize their digital learning experience and continue to drive the quality of learning forward'.[92] Together, the Coursera impact and quality reports position the company as a source of expertise in 'data-driven' online learning, and frame its evolving, AI-enhanced MOOC platform as a quantifiably impactful vehicle for long-term digital transformation in HE.

Long after the 2012 'Year of the MOOC', the commercial online course platform has become a key medium for higher education globally and an extremely lucrative market, with Coursera alone valued above $1bn (an edtech 'unicorn') even before the pandemic.[93] The India-based online learning platform Unacademy also received a very large investment from the Japanese investment bank SoftBank, bringing its value to $1.5billion and second only to Byju's in the Indian edtech market.[94] At the same time, the Beijing-based tutoring app Yuanfudao raised $2.2billion from investors led by Tencent (a Chinese multinational technology conglomerate) as part of its planned AI development, making it the most valuable edtech company in the world by October 2020 after reportedly doubling its value in 6 months to $15.5billion.[95] These highly-capitalised providers act as alternative platform education ecosystems, establishing the parameters for education online and mediating the pedagogic relationships between educators and students, while generating the kind of value-creating network effects and escalating user numbers that are characteristic of 'platform capitalism' (Srnicek, 2016).

92   Coursera. 2020. Drivers of Quality in Online Learning. Coursera: https://about.coursera.org/press/wp-content/uploads/2020/10/Coursera_DriversOfQuality_Book_MCR-1126-V4-lr.pdf

93   Forbes. 2019, 28 April. Online Education Provider Coursera Is Now Worth More Than $1 Billion. *Forbes Africa*: https://www.forbesafrica.com/technology/2019/04/28/online-education-provider-coursera-is-now-worth-more-than-1-billion/

94   ET Bureau. 2020, 3 September. SoftBank leads $150 million funding in Unacademy, valuation jumps to $1.5 billion. *The Economic Times*: https://economictimes.indiatimes.com/small-biz/startups/newsbuzz/unacademy-in-talks-to-raise-150-million-led-by-softbank/articleshow/77557009.cms?from=mdr

95   Mascarenhas, N. 2020, 22 October. Chinese live tutoring app Yuanfudao is now worth $15.5 billion. *TechCrunch*: https://techcrunch.com/2020/10/22/chinese-live-tutoring-app-yuanfudao-is-now-worth-15-5-billion/

5. Online program management

As MOOC providers have become more central to university and college course provision, they have begun to merge with a wider multibillion dollar online learning market.[96] Online program management (OPM) refers to infrastructure services provided by vendors to enable universities to deliver online and distance education courses. OPM companies include 2U, Noodle Partners and Academic Partnerships, global education publishers including Wiley and Pearson, as well as MOOC providers that have diversified into the OPM market (Coursera, edX, Udacity, FutureLearn). OPM providers have positioned themselves to support institutions' internationalization strategies, as universities seek out a share of the international student market, but now find themselves in a position to support the transition online for both international and domestic students too. A key aspect of the success of OPMs is that the companies usually cover the up-front costs of setting up an online degree program, and provide the technical infrastructure for university partners to build their courses on. This model saves universities having to front the costs or build the technical platform. The companies then take 50-60% of the student fees as a return on their up-front investment, plus substantial management fees. In this sense, the programmed pedagogic environments of OPMs consist of networking technologies, assumptions about distance teaching methods, lucrative profit-making business models for the companies, and economic cost-saving models for HE providers.

The outsourcing business of OPMs

Noodle Partners is a leading OPM that received $16 million venture capital investment in June 2020. Its business model is based on outsourcing and a complex of financial fee and borrowing structures:

Noodle contracts with nearly 100 third-party companies that offer services from student recruiting and marketing to content management and course design. The company negotiates a rate on behalf of the university for the services, then manages the work. ... [C]olleges are outsourcing the work of outsourcing to Noodle, which helps cobble together and then maintain the different pieces they need to build and operate online programs. ... Noodle charges colleges $22,000 per month in management fees alone for the first program, and $12,000

96   HolonIQ. 2019, 14 February. The Anatomy of an OPM and a $7.7B Market in 2025. HolonIQ: https://www.holoniq.com/news/anatomy-of-an-opm/

per month for each additional program. It also charges a per-credit-hour fee for each student who enrolls in an online program. These costs do not include fees paid for services from other providers in Noodle's network. ... To ease cash flow concerns for universities, Noodle also offers to borrow money on behalf of the institution from MassMutual, the life insurance and financial service company, to cover the upfront cost of launching new programs. The school then pays Noodle a share of its revenues until those funds, plus interest, are paid back. Afterward, the college pays the aforementioned management fees to keep the online programs going.[97]

One of the most successful OPM providers, 2U, provides the OPM platform 2UOS (2U Operating System). 2UOS consists of an online teaching and learning platform, a suite of data analytics for generating information about students, technical support, and targeted, program-specific digital marketing campaigns using machine learning and AI. It has carefully presented itself as a key technology for universities to transition to online teaching during the COVID-19 crisis.[98] Like MOOC providers, 2U reported substantial potential to capitalise on the shift to online learning, with its chief executive claiming during an investor call that 'this forced transition online will substantially increase the demand from universities for our core product offerings and new solutions ... at a time when universities are facing unprecedented financial constraints and challenges makes our traditional full investment model even more compelling and valuable.... The data here is early, but our funnels are filling and converting currently at higher rates than before the pandemic'.[99]

These online learning platform models are exemplars of new modes of public-private partnership in HE. OPMs, claims the education market intelligence consultancy HolonIQ, constitute part of a $7billion 'Global OPM and Academic Public Private Partnership Market' that 'COVID-19 will substantially accelerate' to a $15billion market by 2025:

More so today (COVID-19) than ever, Universities around the world are increasingly seeking private partners to rapidly build capability, to boost and differentiate their offerings, accelerate growth and achieve long-term sustainability. As such, Private Equity and Capital Markets are watching the Academic PPP segment closely.[100]

97   Wan, T. 2020, 9 June. Noodle Partners Raises $16 Million to Help Colleges Build Online Programs. *EdSurge*: https://www.edsurge.com/news/2020-06-09-noodle-partners-raises-16-million-to-help-colleges-build-online-programs
98   Paucek, C. 2020, 16 March. How 2U is Responding to the Coronavirus Pandemic. 2U: https://2u.com/latest/how-2u-responding-coronavirus-pandemic/
99   Motley Fool Transcribers. 2020, 30 April. 2U Inc (TWOU) Q1 2020 Earnings Call Transcript. Motley Fool: https://www.fool.com/earnings/call-transcripts/2020/05/01/2u-inc-twou-q1-2020-earnings-call-transcript.aspx
100   HolonIQ. 2020, 24 April. The $7B Global OPM and Academic PPP Market. HolonIQ: https://www.holoniq.com/notes/the-7b-global-opm-and-academic-ppp-market/

Moreover, OPMs are a key growth technology in a much larger Global Online HE market valued by HolonIQ at $36billion in 2019 and projected to 'accelerate with COVID-19' to $74b by 2025, opening up new 'opportunities' for market providers.[101] By October 2020 HolonIQ calculated that over 770 Universities across the US, UK, Canada, Australia, India and a handful of other markets had established long-term public-private partnerships for online academic programs, including MOOCs, OPMs and skills bootcamps, and projected record growth in the fourth financial quarter of the year. A significant part of this growth, HolonIQ suggested, was due to governments pressuring universities to offer 'short and fast, very high ROI, technology skills led and employer integrated programs'. It predicted 'we will likely see strengthened partnerships and affiliations between universities, vocational colleges, tech companies, employers, industry associations, bootcamps and pathway providers that make up the post-school education and training landscape'.[102] These predictions and market forecasts again illustrate the ways that short-term emergency measures are being presented as signals of long-term market trends to which investors are attracted.

The education journalist Kevin Carey has described OPMs as exemplars of 'the creeping capitalist takeover of HE'. OPMs are 'transforming both the economics and the practice of higher learning', Carey argued a year prior to the first effects of COVID-19 on universities and colleges. 'Instead of students receiving a reasonably priced, quality online degree, universities are using them as cash cows while corporate middlemen hoover up the greater share of the profits'.[103] As OPMs seek partnership deals during the COVID-19 pandemic, they are subtly privatising higher education by creating complex outsourcing and financial agreements with institutions.

OPM agreements change the nature of academic labour. This includes, in some cases, the outsourcing of teaching itself, as they often involve delegating teaching responsibilities to 'outsourced academics hired through OPMs' on precarious, deprofessionalised, and increasingly deregulated and poorly paid contracts, or to 'university-hired academics whose workloads intensify and extensify all at once to absorb a second shift of online teaching often within the same time schedule and with little extra support or remuneration'.[104] And although OPMs before the pandemic were largely confined to graduate education, as a way of

101 HolonIQ. 2020, 1 May. $74B Online Degree Market in 2025, up from $36B in 2019. HolonIQ: https://www.holoniq.com/notes/74b-online-degree-market-in-2025-up-from-36b-in-2019/
102 HolonIQ. 2020, 22 October. 770 Universities. 200 OPMs, Bootcamps and Pathways. HolonIQ: https://www.holoniq.com/markets/higher-education/770-universities-200-opms-bootcamps-and-pathways/
103 Carey, K. 2019, 1 April. The creeping capitalist takeover of higher education. *Huffington Post*: https://www.huffpost.com/highline/article/capitalist-takeover-college/
104 Ivancheva, M., Courtois, A. and Guzman-Valenzuela, C. 2020, 12 October. Ed-tech to the rescue? Platforms, digital labour and the casualisation of academic work. The Post-Pandemic University: https://postpandemicuniversity.net/2020/10/12/ed-tech-to-the-rescue-platforms-digital-labour-and-the-casualisation-of-academic-work/

enabling internationalisation through distance learning, OPM providers are increasingly targeting undergraduate education too as universities and colleges seek longer-term platform solutions. This is likely to lead to a position where greater numbers of students are taught either by outsourced faculty hired directly by, and contracted to OPM providers, or by university and college staff on precarious, temporary and fragmented contracts. OPMs anticipate the emergence of an educational 'gig economy' in which low-income, deprofessionalised and precariously-employed educators have to compete for short-term contracts to teach on outsourced and partly automated online degree programs.[105] They exemplify the rise of the 'gig academy', universities that outsource many of their teaching and administrative functions, which have implications for diversity and equity, since women and people of color are overrepresented in contingent positions and those most vulnerable to outsourcing.[106]

Wealthy online learning organisations are now establishing the technical infrastructures for remote teaching and learning in HE at international scale. Often working ahead of any official national policy mandates, these market providers act as 'shadow' policy centres that can set the technical parameters for pedagogy during the pandemic, and as a longer-term model for post-pandemic HE recovery and transformation. They are also now servicing governmental demands for universities to offer 'bitesized', modularised and high ROI online study options, as well as full degree programs, that are dedicated to industry-based skills development and post-pandemic economic recovery.[107] As such, the business and market model of online learning platform companies have become integral to political recovery plans for the post-pandemic economy, whilst raising the prospect of outsourcing teaching to 'gig teachers' and exacerbating the precarious labour conditions of university educators.

6. Student-consumer edtech

Historically, many edtech providers have been institutionally focused. However, during the pandemic there has been a rapid growth of direct-to-consumer edtech as students reach out for learning assistance. Students, learning from home, are turning to private tutoring platforms, AI learning assistants and streaming on-demand content as consumer-

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105 Joshi, R. 2020, 17 July. Assessing the potential for a gig economy in education. *TechCrunch*: https://techcrunch.com/2020/07/17/personalized-learning-online-and-the-potential-for-a-gig-economy-in-education/

106 Flaherty, 2019, 10 October. 'The Gig Academy'. Inside Higher Ed: https://www.insidehighered.com/news/2019/10/10/you've-heard-gig-economy-what-about-gig-academy

107 Woolcock, N. 2020, 21 October. Bitesized study and flexible loans could help more people earn degrees. *The Times*: https://www.thetimes.co.uk/article/bitesized-study-and-flexible-loans-could-help-more-people-earn-degrees-v3lt32dcv

focused digital pedagogic environments. Chegg, for example, an online student learning platform offering textbooks, tutoring and other student services, outperformed forecasts by generating $132 million in revenue in the first quarter of 2020[108]. Similarly, online course providers, like Coursera, are reporting huge numbers of new subscribers (upwards of 13 million since mid-March 2020) as adults engage in 'edu-tainment'; that is, the learning of new skills while they're in lockdown or out of work. There are also big institutional players, such as Pearson, offering direct-to-student services. For example, 'Aida by Pearson' is an AI-powered calculus tutor in which students can get personalised feedback on their handwritten work, watch customised videos that explain the concepts they're struggling with and receive resources and study materials to help them improve.[109] Students can access all these services for $2.99 per month through the Aida app. These direct-to-consumer services are powered by the idea that very large networks of individual consumers monetize well.

Streaming education consumer services

Through the Course Hero online learning platform, students can access course-specific learning materials - such as study guides, practice questions, class notes, videos, step-by-step explanations, and so on. It sells 'Netflix-like' subscriptions to students (at a cost of $9.95 per month on an annual plan or $39.99 per month on a monthly plan), and is a profitable business with an annual revenue of more than $100 million. However, since the onset of the pandemic, Course Hero has experienced significant growth and triggered approximately $80 million in capital investment during 2020, taking its valuation to $1.1 billion[110]. During 2020 Course Hero has also been able to respond to criticisms about how it generates 'open source' content by launching Educator Exchange, where university faculty can now earn money for uploading academic resources[111]. This solves issues of copyright infringement by placing the onus on faculty who are agreeing to share their resources. The longer term plan here is that in creating a 'direct-to-faculty' relationship, Course Hero can recommend a specific professor who has a specific syllabus on a topic the user is interested

108 Koenig, R. 2020. The post-pandemic outlook for edtech. EdSurge: https://www.edsurge.com/news/2020-06-11-the-post-pandemic-outlook-for-edtech

109 Pearson. 2020. Aida by Pearson. Pearson: https://www.pearson.com/us/higher-education/products-services-teaching/learning-engagement-tools/aida.html

110 Mascarenhas, N. 2020. Course Hero, a profitable edtech unicorn, raises rare cash. *TechCrunch*: https://techcrunch.com/2020/08/26/course-hero-a-profitable-edtech-unicorn-raises-rare-cash/?tpcc=ECTW2020

111 Course Hero. 2020. New Educator Exchange enables college faculty to earn money for academic resources. PR Newswire: https://www.prnewswire.com/news-releases/new-educator-exchange-enables-college-faculty-to-earn-money-for-academic-resources-301103285.html

in. According to market analysts, the opportunity of this model is its ability to provide affordable subscriptions to a diverse customer base. Indeed, we think Course Hero is a clear example of privatisation and commercialisation in which learning has been reduced to individual market exchanges and transactions. This direct-to-student model reflects an assumed future of increasingly 'remote' education serving largely 'nontraditional' students who cannot attend campus due to work and/or family commitments.

Like most services provided during the pandemic, there is optimism within the edtech industry that students will continue to renew their subscriptions after the pandemic, as these tools will have become an essential part of their studying practice. This direct-to-consumer model targets the huge amount of private capital available from positioning learners as customers, and the ways in which learning has become commodified as a private positional good (Verger, Lubienski & Steiner-Khamsi, 2016). In this context, students - or at least those who can afford to - use their resources and advantages to vie for private services in the hope it might bring them competitive advantage. Targeting students directly allows commercial players to bypass the regulatory environments of HE institutions that often control access, IP, data privacy and so on.

7.   Reimagining credentials

Student-consumer edtech paves the way towards new forms of credentialing and certification in HE. Rather than the conventional, university degree model, there are new educational imaginings that claim to better understand what students want, and indeed, what the economy now needs. This has been reflected in recent years by the emergence of 'digital credentials' as easily shareable 'badges', 'digital certificates' and 'micro-credentials' offered through online courses either by universities or by industry as part of their 'education as a benefit' employee training programs, and which have become a key focus of education and technology organisations such as Pearson.[112]

Microsoft, for example, recently launched the Global Skills Initiative. The aim of this program is to expand access to digital skills, particularly for those individuals 'hardest hit' by COVID-19 job losses, including those with lower incomes, women and underrepresented minorities. Microsoft

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112   Pearson Digital Credentials in Higher Education: https://www.pearson.com/us/higher-education/products-services-institutions/digital-credentials.html

claims this initiative is grounded in three areas of activity: 1) The use of data through an 'economic graph' to identify in-demand jobs and the skills needed to fill them; 2) Free access to learning paths and content to help people develop the skills these positions require; and 3) Low-cost certifications and free job-seeking tools to help people who develop these skills pursue new jobs. These areas are brought together through various platform partnerships, where data about jobs and skills is sourced from LinkedIn, free access to learning content is provided through LinkedIn Learning, Microsoft Learn and the GitHub Learning Lab, and certifications and training are provided by Microsoft Certifications and LinkedIn job seeking tools.

Microsoft argues that this initiative responds to the global recession caused by COVID-19 and is providing opportunities to those with lower educational attainment. They predict that they will reach 25 million people in 2020 alone, however,

> *In many ways, our ambitions are larger than this. For every part of Microsoft, including LinkedIn and GitHub, this marks a new beginning that will build on everything we have today and a new wave of technology innovation to come. We believe we can combine the best in technology with stronger partnerships with governments and nonprofits. Together we can better serve people, filling jobs and creating opportunities for individuals around the world. We should all aspire to turn a year that had a bleak beginning into a decade that has a bright finish. We bring a long-term determination and a commitment to do our part.[113]*

Similarly, Google has launched Career Certificates. These certificates take approximately 6 months to complete, are hosted online by Coursera, and allow students to become 'job-ready for in-demand, high-paying roles'.[114] Google argues that their certificates will connect people with top national employers who are hiring for related roles, such as data analysts, project managers and IT support specialists. Google has also claimed that in their own hiring they would treat these 6 month certificates as the equivalent to a related 4 year university degree.[115]

Both Microsoft and Google have targeted the long-term argument that universities are not producing job-ready graduates. Instead, they argue that their courses provide sufficient skills for a direct pathway into related work. While the cost of these certificates isn't yet clear, Bariso notes, 'a similar program Google offers, on online learning platform Coursera, the

113 Microsoft. 2020. Microsoft launches initiative to help 25 million people worldwide acquire the digital skills needed in a COVID-19 economy. Microsoft blog: https://blogs.microsoft.com/blog/2020/06/30/microsoft-launches-initiative-to-help-25-million-people-worldwide-acquire-the-digital-skills-needed-in-a-COVID-19-economy/
114 Google. 2020. Google Certificate Training Programs. Google Grow: https://grow.google/certificates/
115 Bariso, J. 2020. Google has a plan to disrupt the college degree. Inc: https://www.inc.com/justin-bariso/google-plan-disrupt-college-degree-university-higher-education-certificate-project-management-data-analyst.html

Google IT Support Professional Certificate, costs $49 for each month the student is enrolled'. This means that a 6-month certificate might only cost a student $300 - a fraction of the cost of a traditional university degree. While both Microsoft and Google have so far only targeted the development of digital skills in their reimagining of credentials, if successful, it seems that this model of direct-pathway skills training would entirely disrupt HE as we know it.

A recent US edtech startup called Virtually both exemplifies and extends this model. Based on the template of Shopify, a successful e-commerce platform that allows retailers to set up online stores, Virtually enables education providers to piece together calendar, communication, payment and other tools to operate an online educational program, and targets entrepreneurs who want to teach trades and skills specific to industry jobs. Its founder, a former Facebook engineer, claims 'Our vision is to decouple education from traditional institutions and put it in the hands of those with relevant experience and a passion for teaching. We feel like the best people to be teaching job skills are people from the industry'. With a pricing model that charges providers for use of the platform, in September 2020 Virtually closed a deal for $1.75million investment led by the global investment firm Global Tiger.[116] Virtually therefore represents the emergence of a startup model for prospective alternative HE providers to utilise for-profit platform technologies to deliver online schools and industry-specific skills and qualifications.

Another alternative form of credentialing is 'education as benefit' programs. This refers to employer-based and job-focused training programs that are linked to HE institutions as 'microlearning' or 'nanodegree' programs, where the employer pays tuition fees for courses usually hosted on an online learning platform such as Degreed, Guild Education, Pearson Accelerated Pathways, or a MOOC platform such as Coursera.[117] During the pandemic, the 'upskilling platform' Degreed, which uses employee 'talent profile' data and analytics to personalise recommendations for learning and development programs, 'announced $32 million in new funding in direct response to overwhelming demand for better skill insights, talent mobility, and a user-focused learning experience'.[118] The education as benefit sector, with billions of employer dollars going to universities and universities paying platforms for recruitment and hosting of online courses, is considered a very 'hot space'

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116   Wan, T. 2020, 28 September. A 'Shopify for Online Schools' Raises $1.75M Led by Tiger Global. *EdSurge*: https://www.edsurge.com/news/2020-09-28-a-shopify-for-online-schools-raises-1-75m-led-by-tiger-global
117   Gallagher, M. 2020, 30 January. To Better Serve Adult Learners, Eliminate the Barriers Between Work and Learning. *Edsurge*: https://www.edsurge.com/news/2020-01-30-to-better-serve-adult-learners-eliminate-the-barriers-between-work-and-learning
118   Degreed. 2020, 16 June. Degreed adds $32 million to fast-track capabilities for upskilling, reskilling and redeploying workers at scale. GlobeNewswire: https://www.globenewswire.com/news-release/2020/06/16/2049078/0/en/Degreed-adds-32-million-to-fast-track-capabilities-for-upskilling-reskilling-and-redeploying-workers-at-scale.html

for monetisation and investment.[119] In autumn 2020, Pearson launched its Pathways platform, a service allowing users to search for, compare, and receive personalised recommendations about online job-focused courses.[120]

8. Challenger universities and new PPPs

Throughout the pandemic there has been a rise in advocacy for alternative providers of HE that aren't in the form of traditional 'outdated' universities. For example, UK edtech investor, Emerge Education, has published a series of think pieces about how we might conceive 'challenger universities', or alternative providers.[121] There is a sense across this series that HE is a landscape devoid of innovation, and that there is a pressing need for new entrants that can improve the student experience and offer better outcomes at scale. Part of this is about recognising the future student - largely as someone online or offshore that is attempting to balance study with work and/or family commitments. Also, it's about understanding Gen Z, and tailoring learning in ways that will better engage them. According to Barosevcic who authors these think pieces, a challenger university should be distinguished from other educational offerings (like the Micrsosoft and Google Certifications above) by three key dimensions:

1) Length and depth: 1–4-year holistic learning journeys often equivalent to undergraduate/BA or postgraduate/MA degrees covering a depth of learning outcomes furthering both skills and knowledge. NOT short 3 to 12-month diploma/vocational experiences that are primarily skills-focused.

2) Independence: organisations that drive innovation in house and have it at their core, and own each part of the value chain from student acquisition, delivery of teaching to student success, rather than relying on or being third parties such as online programme managers (OPMs) or massive open online courses (MOOCs).

3) Innovation: programmes that have distinguishable features across at least one of the following traits: student experience, student outcomes, programme scalability and target audience.[122]

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119 Wan, T. 2019, 13 November. A $157M Fundraise for Guild Education Births Edtech's Newest Unicorn. *EdSurge*: https://www.edsurge.com/news/2019-11-13-a-157m-fundraise-for-guild-education-births-edtech-s-newest-unicorn

120 Pearson Pathways: https://www.pearson.com/pathways

121 Barosevcic, M. 2020, 15 April. Challenger universities: the case for innovation. *Medium*: https://medium.com/emerge-edtech-insights/challenger-universities-pt-2c-the-case-for-innovation-d8d1867bb131

122 Barosevcic, M. 2020, 23 April. Challenger universities: the challenger university landscape. LinkedIn: https://www.linkedin.com/pulse/challenger-universities-pt-3a-university-landscape-mario-barosevcic

Indeed, Barosevcic offers a number of examples of institutions doing this work. And while, these institutions might well be innovative, they also present a particular case of HE privatisation, or at least the changing configurations of public institutions and/or the blurring of distinctions between public and private.

Blending HE and industry through public-private partnerships

The University of Arizona (AU) is a nonprofit public HE institution. However, over recent years it has engaged in a series of public-private partnerships in an attempt to broaden its accrediting arrangements. For example, AU has recently acquired Ashford University - a fully online, for-profit college owned by the Zovio corporation. Rather than making Ashford part of AU proper, university officials have set up a separate non profit organisation called the University of Arizona Global Campus. The reasons for this, as explained by Carey,[123] are complex. As a nonprofit, Global Campus will take over and re-brand Ashford's academic assets for a cost of $1. However, Zovio will continue to provide marketing, recruiting, IT support, instructional design and other services for Campus Global. Each year, Zovio will be reimbursed for the costs of these services, and an additional 19.5% of the tuition money received by Global Campus. Carey estimates this is a deal worth approximately $253 million per year to Zovio. Business analysts have praised this as a positive development for Zovio.[124] But it's also a good deal for AU. First, Global Campus has been guaranteed $250 million in revenue over the next 15 years (all paid by Zovio, including a $37.5 million upfront payment). And beyond Global Campus paying Zovio the agreed annual costs, additional profits can be funneled back into ASU proper 'through a licensing agreement' in which Global Campus will pay ASU millions of dollars for use of the name 'University of Arizona'. It's important to note that students enrolled in University of Arizona Global Campus will not be given degrees from AU. Global Campus might be affiliated with AU in name, but it is a separate nonprofit institution with its own leadership, faculty and academic programs. As Carey identifies, these complex arrangements make it difficult for students to understand what they're getting into when they enrol in an online college, and that while they might think they're enrolling in a trusted public university, the actual arrangements are blurring the lines between public and private, nonprofit and profit. Indeed, AU staff

123   Carey, K. 2020, 11 August. Proposed merger blurs the line between for-profit colleges and public universities. *New York Times*: https://www.nytimes.com/2020/08/11/upshot/university-of-arizona-ashford-zovio-online-college.html

124   McKenzie, E. 2020, 4 August. University of Arizona's Big Online Push. Inside Higher Ed: https://www.insidehighered.com/news/2020/08/04/university-arizona-acquires-ashford-university

> have questioned why there wasn't more widespread consultation with faculty about this move and are worried about potential damage this partnership might bring to AU's reputation.

Of course, AU is just one example of how 'challenger universities' might privatise the HE sector, and turn degrees into corporate profits. In October 2020, the global education business Pearson announced a partnership with Coventry University in the UK to run a new qualification 'to give Pearson Higher National students access to a UK honours degree, as a seamless and integrated offer.'[125] Awarded by the university, students will study for the qualification remotely through 'Pearson Approved Centres' within their home country. In this sense, the public-private partnership between Pearson and Coventry University outsources the provision of a degree to the commercial partner.

We are not suggesting that these arrangements shouldn't exist, and we recognise the need to expand HE access to more people at a lower cost. But, we think this provides an interesting case to explore how PPPs, mergers, acquisitions and integrations can work to hide or disguise profit making activities. Moreover, we need to examine how these aspirations for broader access are fulfilled. For example, are these courses actually taken up by individuals who would not otherwise access HE opportunities or those already following a HE path looking for cheaper, more flexible arrangements?

9. Campus in the cloud

The COVID-19 pandemic has resulted in rapid expansion of for-profit cloud infrastructures for universities. Indeed, there has been significant talk of HE institutions having to play 'infrastructure catch up' as they rapidly move to cloud systems that can handle the new demands of remote and hybrid delivery. Cloud solutions, like those offered by Google, include storage, analytics, big data, machine learning and application development.[126] Instead of just using a cloud for email storage solutions, universities are now exploring the entire infrastructure of cloud computing:

Google solutions create the powerful computing infrastructure that keeps today's higher ed communities humming. Researchers can speed up

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125   Pearson. 2020, 26 October. Pearson and Coventry University collaborate to create integrated BTEC Higher National Degree proposition. Pearson blog: https://www.pearson.com/uk/about-us/news-and-policy/news/2020/10/pearson-and-coventry-university-create-integrated-btec-hn-degree.html

126   Google. Powering possibilities with Google Cloud: https://edu.google.com/products/google-cloud/?modal_active=none&story-card_activeEl=for-institutions

analysis from days to minutes, working seamlessly across departments and data sets. Students and faculty can collaborate easily and securely across disciplines and campuses. And campus staff can work more efficiently and effectively.[127]

There has been a particular push to adopt cloud systems that can provide online education solutions in which content can be developed, and delivered across very dispersed, large-scale networks. Such dispersed systems, which integrate student information systems, learning management systems, and a wide range of other third party learning platforms, are able to make diverse forms of data interoperable for large-scale student analytics.

Amazon Web Services (AWS), for example, launched new services and a price discount program in September 2020 for universities to develop 'data lakes' of very large volumes of heterogeneous information for machine learning analysis and visualisation on data dashboards.[128] The process of 'architecting a data lake for higher education student analytics' involves the deployment of multiple AWS products and functionalities, including those for pulling student learning data from LMS providers such as AWS partners Canvas or Blackboard, and then utilising AWS programs for handling the 'machine learning workload' of analysis.[129] This level of 'architecting' knits universities into the vast cloud infrastructures of AWS and into the very technical systems that underpin the rapid growth of the data economy. It anticipates the emergence of a new kind of 'cloud campus' that exists synchronously in global technology infrastructures and physical campus settings, and where the cloud has the potential to shape or determine on-campus action and decision making.

The cloud 'bridge'

Alibaba Cloud claims it is the 'number one cloud vendor in China' with the ability to help businesses flourish in Mainland China with 'guaranteed network quality'.[130] To this end, Alibaba is being used as a 'bridge' between university portals and mainland Chinese students during the pandemic. This allows Chinese students to access content from the foreign universities they are enrolled in during a time when they are prevented from physically travelling to international campus locations. In the likes of Australia, where HE funding arrangements are reliant on international student fees, Alibaba has been instrumental in

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127 Google. Creating new possibilities in higher education: https://edu.google.com/why-google/higher-ed-solutions/
128 Nanjiani, N. 2020, 17 September. Building a data lake at your university for academic and research success. AWS Public Sector Blog: https://aws.amazon.com/blogs/publicsector/building-data-lake-your-university-academic-research-success/
129 Jordan, C. and Berkley, T. 2020, 22 October. Architecting a Data Lake for Higher Education Student Analytics. AWS Architecture Blog: https://aws.amazon.com/blogs/architecture/architecting-data-lake-for-higher-education-student-analytics/
130 Alibaba. Alibaba Cloud: https://au.alibabacloud.com

providing continuity of enrolment for Chinese students. The Council of Australiasian University Directors of Information Technology (CAUDIT) said 30 of its 47 affiliated universities are using the Alibaba cloud, including the University of Sydney, University of Adelaide, University of Canberra, and University of Melbourne.[131] Some commentators have noted that the adoption of this cloud solution technology might have long term benefits for how Australian universities provide education to international students moving forward.[132]

There are also cloud solutions being targeted at helping HE institutions return to campus. For example, SalesForce Education Cloud is specifically focused on providing data-driven insights for the safe reopening of campuses. They use the University of Kentucky as an example of what a return-to-campus plan might look like, where a number of SalesForce cloud tools are brought together in a (mandated) app.[133] The use of a command centre, individual wellness tracking, and contact tracing graphs is intended to keep students and faculty safe, and allow the quick dissemination of campus-wide information.

10. Student and staff surveillance

A range of tools that have been adopted by HE institutions - ostensibly for teaching and learning activities - actually expose students and staff to increased forms of surveillance. Exam proctoring tools, for example, have generated much controversy around the world. The use of these tools means that students are 'watched' as they take tests, with recorded patterns of keystrokes, facial recognition, gaze-monitoring and eye-tracking, and the use of microphones and cameras to record students' surroundings and broadcast them to a remote proctor. These proctoring apps are, for some critics, considered indistinguishable from 'spyware'. They gather invasive biometric data from students and collect (and retain) personally identifiable information including, 'full name, date of birth, address, phone number, scans of government-issued identity documents, educational institution affiliation, and student ID numbers':

The companies retain much of what they gather, too—whether that's documentation or video of bedroom scans. Some companies, like

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131   Li, P. 2020, 27 July. Aussie universities turn to Alibaba cloud to keep Chinese students studying. *IT News*: https://www.itnews.com.au/news/aussie-universities-turn-to-alibaba-cloud-to-keep-chinese-students-studying-550877

132   ZDNet. 2020. How universities are grappling with the need to provide education through COVID-19 distancing. *ZDNet*: https://www.zdnet.com/paid-content/article/how-universities-are-grappling-with-the-need-to-provide-education-through-COVID-19-distancing/

133   Salesforce.org. 2020, 17 July. Back to campus: University of Kentucky's comprehensive return-to-school plan. Salesforce blog: https://www.salesforce.org/blog/university-of-kentucky-reopen-safely/

ProctorU, have no time limits *on retention. Some of this information they share with third parties. And when student data is provided to the proctoring company by an educational institution, students are often left without a clear way to request that their data be deleted because they aren't considered the data's "owner."* [134]

The concern is not only a significant invasion of privacy, but also equity for students, particularly those who have little control over their surrounding environments.

Similarly, the use of telepresence lectures and video conferencing tools has been problematic for universities. For example, Zoom, has been the centre of much discussion - and is often praised as the tool that has allowed a rapid and easy shift to online instruction. However, there have also been concerns. Initially, concerns centred on 'Zoom bombing' in which an individual - not involved in the class - would enter the room, take over the screen sharing function to broadcast racist, misogynistic and homophopbic images. Zoom's response to this issue was to release (more expensive) institutional accounts, with supposedly better privacy settings. Regardless, there remains ongoing concerns for student and instructor privacy. Most Zoom lectures are recorded so that students can view the 'live' lecture in their own time. This has raised issues for student images, discussion and chat functions to be recorded. And, as suggested by USSbriefs, Zoom is able to harvest call data - often at the expense of users' security and privacy - and sell it to third parties.[135] Similarly, this same brief raises concerns that university administrators are able to use Zoom recordings to monitor and rank staff. There are fears that these features could be used to justify staff cuts and/or redundancies. It may also lead to self-censorship, where staff alter their usual curriculum in fear of repercussions from surveillance.

In addition, Zoom is likely to extend and intensify its reach into higher education. In September 2020, a new edtech startup called ClassEdu was created, raising $16 million in seed funding to develop Class for Zoom. Class for Zoom is a planned Zoom add-on with features such as the ability to take class attendance, get data insights into student participation, issue interactive quizzes during class, and monitor the tabs that students open while in exam mode, making the software a powerful proctoring tool too.[136] 'Due to COVID, millions of students are struggling online and

134   Kelley, J. & Oliver, L. 2020, 20 August. Proctoring apps subject students to unnecessary surveillance. EFF: https://www.eff.org/deeplinks/2020/08/proctoring-apps-subject-students-unnecessary-surveillance
135   USSbriefs. 2020, 6 July. Zoom out: why universities need autonomous technological capacities. *Medium*: https://medium.com/ussbriefs/zoom-out-22f505559f65
136   McKenzie, L. 2020, 29 September. Innovators Seek Zoom University 2.0. Inside Higher Ed: https://www.insidehighered.com/news/2020/09/29/companies-and-instructors-build-technology-take-remote-instruction-video-tools-next

education is changed forever. We founded Class for Zoom to help', reads its website invitation for educators to participate in beta tests.[137]

The emergence of an industry of tracing apps for a 'COVID-safe' campus have also raised privacy concerns. These apps typically track students' movements at all times, and often include a tool to self-report any illness or cold/flu like symptoms. In the case of BioIntelliSense, they offer a 'BioButton' add on, which is a 'discreet', 'FDA-cleared medical-grade wearable' that continuously monitors for COVID-19 symptoms,

> *The BioButton™ wearable medical-grade monitoring and BioMobile™ daily screening surveys establish COVID-19 risk status with 'Cleared' and 'Not Cleared' notifications before leaving for work or school. BioButton's continuous temperature and vital signs monitoring, combined with advanced analytics, enables the BioButton to identify statistically meaningful trends and screen for early potential COVID-19 infection.[138]*

One account of students returning to campus at Albion College in the US detailed that students must download the 'Aura' COVID-tracing app before they can participate in campus-based activities. Moreover, students are only free to move around a campus 'safe zone' and if they leave this area, university administrators are notified by the app. This means that students working off-campus need approval to do so, and have been denied if the exposure risk is deemed too high.[139] These type of technologies introduce bio-surveillance and epidemiological monitoring on to campuses, thereby raising critical issues related to data security, privacy and ethics, as well as the risk that health data might be repurposed or monetised in the 'after-life' of the pandemic.[140]

11. AI transformations

Across many of the categories covered in the sections above there is an evident focus on the enhanced deployment of data analytics, machine learning and artificial intelligence in higher education. This is reflected in the language of personalised learning and data-driven decision-making, which has been central to the edtech industry's expansion over the past decade, and in the growing market of edtech providers promoting AI-based products (Renz and Hilbig 2020). Just prior to the onset of the

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137   ClassEdu Class for Zoom: https://www.classedu.com/
138   BioIntelliSense. New! Bio Button COVID-19 Screening Solution: https://biointellisense.com/biobutton
139   Marowski, S. 2020, 21 August. Coronavirus app doesn't track students' locations all the time, Albion College president says. *Mlive*: https://www.mlive.com/news/2020/08/coronavirus-app-doesnt-track-students-locations-all-the-time-albion-college-president-says.html
140   Roberts, S.L. 2020, 20 April. Tracking Covid-19 using big data and big tech: a digital Pandora's Box. LSE Politics and Policy: https://blogs.lse.ac.uk/politicsandpolicy/tracking-covid-19/

pandemic, in late 2019, the fourth annual 'Global Education Industry' summit (organised by the OECD, European Commission, and the Estonian Ministry of Education and Research) focused thematically on 'Learning in the Data Age', bringing together education ministers and officials with industry to consider the potential of learning analytics, big data and artificial intelligence in national education systems.[141] The Global Education Industry summit represented the convergence of education data science, learning analytics and AI with the commercial education technology sector, international policy-influencing organisations, and national education system leaders. Its key emphasis on deploying AI has taken on renewed salience in relation to the COVID-19 pandemic.

AI in education has been justified during COVID as helping to 'speed up the process of catching-up' for students who experienced 'learning loss' as a result of cancelled classes, which it would do 'by working with students individually to diagnose their needs and to provide carefully selected catch up learning opportunities and vital feedback for teachers'.[142] The emphasis on personalised learning via AI was also present in a Microsoft-commissioned white paper, published in April 2020 and entitled 'Transform Student Engagement: Achieve Personalized, Efficient, Inclusive, and Accessible Higher Education with AI':

> *[It is] an economic imperative for higher education institutions to evolve education as quickly as the job landscape, so that everyone has the chance to gain the skills to not just fill those jobs but thrive. Achieving this requires not only skills for future jobs (future-ready skills) but also improving student engagement for all learners by providing students with artificial intelligence (AI)–powered hyperpersonalized, accessible, and inclusive learning experiences and tools. In the process, such institutions will also help ensure that they remain competitive and relevant.[143]*

The paper highlighted Microsoft's existing AI capacity to support personalised learning, its machine learning platforms for automated grading, scheduling, and 'Conversational' AI supporting interactive question answering systems such as chatbots and digital assistants. One of Microsoft's products listed in the report, and promoted extensively by the company throughout 2020, is the Power Platform. 'Today's unprecedented public health and educational crisis is creating enormous challenges for institutions of higher education,' stated a Microsoft Education post introducing the platform. The Power Platform integrates

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141 Global Education Industry summit 2019: https://estonia.ee/geis2019/
142 Luckin, R. 2020, 17 August. Three questions with Turing Lecturer Rose Luckin. Turing Institute: https://www.turing.ac.uk/blog/three-questions-turing-lecturer-rose-luckin
143 Jyoti, R. and Sutherland, H. 2020, April. Transform Student Engagement: Achieve Personalized, Efficient, Inclusive, and Accessible Higher Education with AI. IDC: https://edudownloads.azureedge.net/msdownloads/IDC-Transform-Student-Engagement.pdf

'AI functionality that allows instructors to automate processes with apps, flows, and bots that integrate with Teams and save time for you, your peers, and your students':

- *With Power Apps, streamline field research by capturing data digitally by building purpose-specific apps, or create instructional and classroom management apps to help make the school day better for students and teachers.*
- *With Power Automate, automate repetitive processes and create actions with AI, boosting productivity.*
- *With Power Virtual Agents, build no-code chatbots capable of tasks like answering your students' questions.*
- *With Power BI, visualize real-time analytics to empower informed, confident decision making.[144]*

The Microsoft Power Platform is a technical instantiation of AI in education discourses and imaginaries, promising personalised learning and smart classrooms as a long-term and economically-imperative transformation to HE.

Other organisations have sought to promote the development of innovative AI for education during the pandemic too. In summer 2020 Schmidt Futures, the investment and philanthropy vehicle of former Google chief executive and chair Eric Schmidt, led a Futures Forum competition, with participation from the Gates Foundation and Chan Zuckerberg Initiative, to award funding to edtech innovations that might 'accelerate the recovery from pandemic learning loss and advance the field of learning engineering'[145] Learning engineering, a core focus of both Schmidt Futures and the Chan Zuckerberg Initiative, represents a combination of data science, analytics and AI with psychometrics, social psychology, and cognitive brain science. For the Futures Forum, Schmidt Futures defined learning engineering as:

> *an emerging discipline at the intersection of learning science and computer science that seeks to design learning systems with the instrumentation, data, and partnerships with the research community, to drive tight feedback loops and continuous improvements in how that learning is delivered in online and blended settings.*

Schmidt Futures also partnered with Citadel, a global investment firm, and drafted in an expert panel including venture capitalists and philanthropic

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144   Microsoft Education Team. 2020, 30 June. Universities tackle big challenges with Microsoft Power Platform Microsoft Education blog: https://educationblog.microsoft.com/en-us/2020/06/universities-tackle-big-challenges-with-microsoft-power-platform/

145   Schmidt Futures learning tools competition: https://futuresforumonlearning.org/tools-competition/

sources of funding. The post-pandemic future of education, the Futures Forum suggested, would depend on combining algorithmic learning engineering applications and sources of private capital. Schmidt Futures also sponsored a series of content on EdSurge dedicated to highlighting the promise of learning engineering, casting it as a form of applied AI that would 'speed up education'.[146]

University 4.0

In October 2020, the University of Buckingham - one of a small number of private HE institutions in the UK - announced a 'trailblazer degree' program as part of its 'Education 4.0' initiative. The accelerated 2-year degree program, planned for delivery from 2022, would use AI extensively to become 'The world's premier Ed 4.0 driven undergraduate degree':

Artificial Intelligence (AI) will be used to create personalised and adaptive course content tailored to each student's specific abilities and learning methods. ... On arrival at University, the AI assisted tools will help assess each student's current level of knowledge and their preferred learning methods. The adaptive learning environment will regularly suggest new content targeted to a student's specific needs. ... AI and intelligent platforms will monitor student engagement and understanding, helping JISC staff to see where students are falling behind or need more materials to aid their learning. ... AI routines can flag up at-risk students and alert University staff to those that may need extra attention by integrating multiple data streams from across the student's programme such as academic performance, engagement with course materials and other students, and drawing information from chatbots.[147]

The institution's former Vice Chancellor is a major supporter of AI in education, having co-authored a book on the subject and founded the Institute for AI Ethics in Education. The trailblazer degree program is being developed in collaboration with JISC, the UK's HE digital teaching and learning agency.

These examples illustrate how the pandemic has been translated into an experimental opportunity to advance AI in education, framed discursively and promoted as personalised learning, learning engineering, or 'Education 4.0' for the Fourth Industrial Revolution. These framings of AI

146   Young, J.R. 2020, 9 June. How 'Learning Engineering' Hopes to Speed Up Education. *EdSurge*: https://www.edsurge.com/news/2020-06-09-how-learning-engineering-hopes-to-speed-up-education
147   University of Buckingham 'Trailblazer Degree' program: https://www.buckingham.ac.uk/trailblazer

are shared by big global technology corporations such as Microsoft and Google; HE agencies such as Jisc; entrepreneurial HE leaders; venture philanthropies including Schmidt Futures, Chan Zuckerberg Initiative and Gates Foundation; edu-businesses such as Pearson, Coursera and 2U; edtech investors and asset managers; international organisations including the OECD, World Bank and World Economic Forum; and academics in fields such as learning analytics, education data science and AIed. These global education industry actors anticipate and are seeking to build 'smarter' education systems that are augmented or even 'optimised' by data-intensive AI products that rely on the constant tracking, monitoring and quantitative analysis of student and staff behaviours. They are building robotised pedagogic environments in which key functions of teaching, such as observing student progress, providing feedback, scaffolding intellectual development, and assessment, are increasingly delegated to or augmented by automated AI technologies.

Key Issues

In this section we highlight the key issues that have emerged from the mapping exercise. The headline finding is that the COVID-19 pandemic has been exploited as an emergency opportunity for private sector and commercial organisations to increase their penetration and influence in higher education. While the responses to the pandemic have clearly been regionally defined and context-specific, we have documented a range of ways in which higher education has been positioned as needing disruptive transformation at international scale, in ways that suggest the creep of 'disaster techno-capitalism' across the sector. Digitalisation in HE has become a key way in which public education may be further privatised and commercialised.

1. Reimagining Higher Education

The developments documented in this report demonstrate some significant ways in which the COVID-19 crisis has become the context for radical reimagining of HE at international scale. The social and technical imaginary of HE as a digitally-enhanced and data-intensive sector has become increasingly shared across different sectoral positions, national borders and organisations, from private consultancies, businesses and the media to international organisations and policy centres. A high-tech imaginary of HE is increasingly materialising through the widespread uptake of educational technologies and related digital products and data solutions services.

Beyond the exceptional emergency circumstances of the pandemic, edtech is being normalised, rationalised and legitimised as an appropriate long-term strategy for the post-pandemic university, college and campus. As we were preparing this report, the Secretary of State for Education in England commissioned the regulatory body for HE, the Office for Students, to produce a review of the evidence on 'Digital teaching and learning in English higher education during the coronavirus pandemic'.[148] Introducing a call for evidence to inform the review, Sir Michael Barber claimed that existing evidence of 'ingenuity and innovation' in digital learning presented an 'opportunity' for long lasting change:

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[148] Office for Students. 2020, 3 September. Digital teaching and learning in English higher education during the coronavirus pandemic: Call for evidence. Office for Students publications: https://www.officeforstudents.org.uk/digitallearning/

With this unprecedented disruption comes an opportunity. In a short space of time many universities and colleges have significantly developed the digital teaching and learning options they offer students. It is critical that we build on this progress – identifying what has worked well in recent months, what methods could be enhanced further, and identifying long-term opportunities for innovation that will benefit generations of students into the future.[149]

This call for evidence highlights how the turn to edtech during the pandemic has been exploited politically as a disruptive opportunity for long-term innovation, and the normalisation of emergency measures - characteristic of 'disaster techno-capitalism' (Taylor et al, 2020) - as a model for reimagining the future of higher education.

2. Governance by technology infrastructures

Governance processes in HE are becoming more technology-centred. Of course, the use of technological infrastructures in HE is not a new phenomenon. Blackboard and Canvas, for example, have long been used to manage student learning (Kasim and Khalid, 2016). Similarly, there has been remarkable growth in OPMs over recent years given they allow universities to upscale their online offerings (Williamson, 2020). However, during COVID-19 we have seen an intensification and a broader penetration of technology infrastructures into HE systems, as new kinds of 'instruments of pandemic governance' (Yeung, 2020) and as programmed pedagogic environments that set the parameters for teaching and learning. For example, there has been a huge growth in the use of learning management systems. These are no longer considered 'peripheral' tools (e.g. to store course content), but have become central to the delivery of courses. The rapid upscaling of learning management systems with third party integrations that allowed seamless recording of content, assessment of students and online meetings were essential for many HE institutions to provide continuity of learning. Indeed, cloud solutions like Alibaba are providing HE institutions a way to continue to deliver their programmes across internationally dispersed networks. However, it is important to note the constraints as well as the positive affordances of such technical systems for how teaching and learning are practised. Colleges and universities have been transformed into

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149 Office for Students. 2020, 3 September. 'Digital poverty' risks leaving students behind. Office for Students news, blog and events: https://www.officeforstudents.org.uk/news-blog-and-events/press-and-media/digital-poverty-risks-leaving-students-behind/

'coded spaces' (Kitchin and Dodge, 2011) in which software performs key tasks, with far-reaching implications for the management and shaping of individual and organisational behaviours.

Moreover, the expansion of platforms such as LMSs and OPMs to encompass AI-enhanced personalised learning is evidence of how commercial edtech players understand and seek to expand their future role in HE. Commercial edtech companies and their infrastructures are increasingly central to the enactment of HE at multiple levels. We understand these developments as constituting a shift from the physical infrastructures of on-campus learning to increasingly online, hybrid and even semi-automated systems of HE. While it is still too soon to tell what the post-pandemic landscape of HE will look like, it seems reasonable to predict that most HE institutions will continue to use these commercial infrastructures to expand their offerings, and that the infrastructures will evolve new data analytics and machine learning capacities. This constitutes a form of governing HE through technology, expanding the policy influence of private sector organisations to become 'shadow' policy centres, setting the format for HE teaching and learning at a distance, and internationally, through technical infrastructures.

3.   University-industry hybridities

New public-private partnerships are working to blur the boundaries between sectors. As public HE institutions become increasingly dependent on private sector business models and market-based practices, they risk privatising HE in the pursuit of profits (Robertson and Komljenovic, 2016; White, 2017). Students, as well as faculty members, may be the victims of these partnerships if they're not managed carefully. For example, the partnership between Arizona University, Arizona University Global Campus and Zovio, may well assist more students to access HE for a reduced cost, but it seems necessary for HE institutions to carefully detail partnership arrangements so students know exactly what educational product they are paying for.

Some PPP arrangements appear to be purposely complex to hide profit making intentions (Verger, Moschetti and Fontdevila, 2020). Yet when students are used to generate these profits with smoke and mirror tactics we need to question the ethics of these arrangements. Notwithstanding this need, public HE institutions will increasingly face competition from private 'challenger' HE models and startups, and there will be a need to address how they can compete with low-cost, online alternatives

moving forward. Already, many HE institutions are feeling the pressure to adopt 'micro' credentials, where courses could be selected on an ad-hoc basis by students and professionals to continually up-skill in the digital economy.[150]

4. Programmed pedagogic environments

Commercial edtech platforms are often shaped by particular conceptions of teaching and learning. Tools such as learning management systems, online learning platforms, and virtual video conferencing facilities carry their own 'programmed pedagogies', or scripts for teaching and learning that are embodied in their technical functionality, and that configure the pedagogic and curricular possibilities of educators:

> *The commercial logic of the Big Tech companies is built into the tools, and these also partly determine which forms of education are possible. ... Big Tech platforms place and keep users within a single environment, with only a small number of standardised forms of expression and interaction on offer. This promotes uniformity and conformity. If we find that PowerPoint has impoverished academic discourse, what will be the effect if we deliver all education through the template offered by Blackboard or 'G Suite for Education'?[151]*

There is a need to ensure that education doesn't become linear as one-way delivery of content from lecturer (through commercial platforms) to students in these programmed pedagogic environments. Part of the issue in the rapid uptake of online learning by HE systems during the pandemic has been that faculty members have been responsible for pivoting their practice online without formal training and support, nor sufficient time and resources. Recent findings from a number of student surveys have suggested that they have found online learning to be of lesser quality than face-to-face instruction.[152] This isn't surprising given most institutions made the switch to online learning in a matter of days. Students are also reporting ill effects of self-isolation, missing opportunities for face to face collaboration with lecturers, and social interactions with other students. Similarly, there are suggestions from students that it is harder to stay motivated on their academic work in a fully online environment.

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150 Gallagher, S. and Palmer, J. 2020, 29 Sep. The pandemic pushed universities online. The change was long overdue. *Harvard Business Review*: https://hbr.org/2020/09/the-pandemic-pushed-universities-online-the-change-was-long-overdue

151 Data Research Centre, University of Groningen. 2020. Distance learning: what will remain of university education after the pandemic? GUNI Network: http://www.guninetwork.org/files/distance_learning_what_will_remain_of_university_education_after_the_pandemic_drc_campus_fryslan.pdf

152 The Three Amigos. 2020, 3 Aug. 65% of students dislike virtual learning environments necessitated by the COVID-19 pandemic. PR Newswire: https://www.prnewswire.com/news-releases/65-of-students-dislike-virtual-learning-environments-necessitated-by-the-COVID-19-pandemic-301104861.html

However, students also report that they enjoy the flexibility of online learning, and many see a hybridised learning environment that mixes online instruction with face to face collaboration as the way of the future.[153] The potential expectation of students to receive both face-to-face and online teaching will raise significant challenges in terms of academic labour, and could catalyse further development of supplementary 'consumer edtech' services including those where precariously employed staff submit resources for purchase by student consumers. It could also lead to increased use of data and AI tools that can compensate for teachers by providing automated feedback and interventions.

5. Datafication and surveillance

While there have been positives associated with the shift to online instruction, the expanding dataveillance systems have been widely critiqued. Often, these services are set up to monitor staff and students, and allow HE systems to function as normal. For example, proctoring services have allowed online examinations, video conferencing programs have enabled real time collaboration and COVID-safe tracing apps have meant that some HE campuses have been re-opened to students. However, all of these functions have been met with significant privacy concerns. The constant monitoring of students has led to student stress and anxiety around their loss of autonomy, as well as discrimination against young people from marginalised communities.[154] The introduction of AI into online learning platforms is intended to provide more 'personalised' learning experiences, but also increases student surveillance through the monitoring of their digital learning traces. Moreover, the data practices of commercial companies has meant that student data might be sold onto third parties often for advertising purposes.

Despite these concerns, this is a highly lucrative space for for-profit commercial edtech provision. Indeed, they have been intensifying and expanding in response to the pandemic. Zuboff (2019) warns that 'surveillance capitalism' - the commodification of personal information - is reducing the capacity of individuals to act freely and independently. While the solutions offered to HE are seen as necessary to maintain or improve continuity of learning, they have potentially dangerous consequences

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153 QS Top Universities. 2020, 9 Jun. My experience of online learning and self-isolation. QS Top Universities: https://www.topuniversities.com/where-to-study/europe/russia/my-experience-online-learning-self-isolation

154 Retta, F. 2020, 26 October. Exam Surveillance Tools Monitor, Record Students During Tests. *Teen Vogue*: https://www.teenvogue.com/story/exam-surveillance-tools-remote-learning

for rights, privacy and security. The most concerning issue for HE moving forward is whether these practices become normalised in the post-COVID environment because technological solutions are easier, and more cost effective.

6. Academic freedom and autonomy

One of the unique areas of concern that has emerged from COVID-19 in the HE context is around guaranteeing academic freedom of staff and students. Instructors have had little say in the unilateral decision to pivot to online learning, and have largely had to accept the tools provided by their HE systems to do so. The expansion of data analytics, AI and predictive technologies potentially also challenges the autonomy of staff to make professionally informed judgments about student engagement and performance, by delegating assessment and evaluation to proprietorial software that can then prescribe 'personalised learning' recommendations on their behalf - 'robot teachers' acting in programmed pedagogic environments that are fundamentally reconfiguring education by making pedagogical and policy decisions typically left to teachers and policymakers (Zeide, 2017).

Another issue is the link between intellectual property (IP) rights over digital teaching content and academic freedom. In the traditional teaching environment it is customary for academics to hold ownership over what they produce, as control over content is essential for the exercise of academic freedom, but in the digital environment - where teaching materials are uploaded to LMS platforms, lectures delivered over videoconferencing and captured by recording software - content ownership and IP are less clear.[155] Moreover, concerns raised about videoconferencing and exam proctoring software - by both staff and students - have sat in tension with the need to protect privacy and also the need to deliver continuity of learning and assessment.[156]

The academic freedom issue has also emerged in the context of platforms such as Zoom, YouTube and Facebook censoring classes and events, as online learning has become vulnerable to corporate control and the policing of the internet for controversial or critical thought.[157] Commercial providers have terms of service that grant them significant

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155 Maloney, E.J. and Kim, J. 2019, 12 June. Intellectual Property and Digital Learning. *Inside Higher Ed*:
      https://www.insidehighered.com/digital-learning/blogs/technology-and-learning/intellectual-property-and-digital-learning
156 Critical Business. 2020, 6 Jul. Zoom out: Why universities need autonomous technological capacities. USS Briefs:
      https://medium.com/ussbriefs/zoom-out-22f505559f65
157 Wilson, J.K. 2020, 23 September. Zoom, YouTube, and Facebook Censor Event at SF State. Academe blog:
      https://academeblog.org/2020/09/23/zoom-youtube-and-facebook-censor-event-at-sf-state/

powers to determine what is permissible to broadcast over their platforms.[158] Similarly, there has been concern raised over situations in which students are studying remotely in jurisdictions where there are severe forms of internet censorship and surveillance. For example, HE institutions that are offering remote learning to students studying in China have had to ensure course content complies with strict Chinese Internet regulations about 'allowable' material. While Alibaba provides the virtual connection, instructors' might have to engage in 'self-censorship' if teaching 'sensitive topics' to ensure the links and resources embedded in their course material work.[159] In the UK this has led to the production of a 'Model Code of Conduct for the Protection of Academic Freedom and the Academic Community in the Context of the Internationalisation of the UK Higher Education Sector'. The code aims to protect against states or organisations directly or indirectly curtailing intellectual inquiry and critical thinking, such as by preventing academics expressing views, as well as teaching and conducting research, on topics within their areas of academic expertise:

> *Violations of the right to academic freedom in this context can involve and result in surveillance, intimidation, self-censorship, suspension, being banned from academic posts, persecution, attacks, visa denials, deportation, coercive pressure on relatives, prosecution, detention, or, in the most extreme cases, death, obviously impacting the enjoyment of other fundamental rights, such as the right to privacy, freedom of expression, liberty and life.[160]*

Moreover, the fact that lectures are now recorded and posted online - and subjected to surveillance by administrators - has potentially heightened concerns about the way staff are censoring their curriculum content, and highlights the extent to which contemporary academic work is embedded in surveillance and censorship infrastructures (Tanczer et al, 2020). Online learning technologies, like performance metrics and rankings, have become new 'engines of anxiety' in HE, potentially inducing new kinds of reactive behaviours among staff and managers (Espeland and Sauder, 2016).

Perhaps the most widespread longer-term fear emanating from academics is whether HE institutions will use the pandemic as a catalyst for adopting more online teaching. While this is not to suggest that

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158 NYU-AAUP Executive Committee 2020, 23 October. Statement from the NYU-AAUP on Zoom Censorship Today. Academe blog: https://academeblog.org/2020/10/23/statement-from-the-nyu-aaup-on-zoom-censorship-today/

159 Coughlan, S. 2020, 9 Jul. UK universities comply with China's internet restrictions. BBC News: https://www.bbc.com/news/education-53341217

160 Academic Freedom and Internationalisation Working Group. 2020. Model Code of Conduct for the Protection of Academic Freedom and the Academic Community in the Context of the Internationalisation of the UK Higher Education Sector. Human Rights Consortium: https://hrc.sas.ac.uk/networks/academic-freedom-and-internationalisation-working-group/model-code-conduct

academics are against online teaching, rather, that they understand the difference between 'good' online education and the rapid transition to online learning that they have been asked to adopt during 2020. Indeed, there has long been a sense that HE needs digital transformation, and new ways to connect with diverse learners. But what tends to happen - and perhaps what the PPP between Arizona University, Arizona University Global Campus and Zovio suggests - is that these online options are 'second-tier' and tied to enhanced profit making agendas. The online teaching happening during this pandemic is not a representation of what online learning should be. It is merely instructors and students adapting as best they can to provide continuity of learning. A future of enhanced online learning in HE shouldn't be driven by start-up companies and private capital, but by academic freedom in understanding what good and thoughtful online and hybridised learning is. It should pay attention to student desires and also be critical of the claims of commercial edtech. Similarly, academics should be able to have the freedom to choose what products and services, if any, they want to adopt. In particular, we should be wary of products that threaten professional autonomy, where course material and assessment is organised by what can be datafied and coded.

7.   Reproducing inequalities

For many students, particularly student-consumers with monetary resources, they have been able to maintain a connection to their HE degree throughout the pandemic. But there are also students that have been left with little option other than to pause or cancel their enrolments. Inequities are shaped by gender, class, culture, race and geopolitical context. Much of this report has focused on the Anglophone context, both by the limitations of its monolingual authors, and the geopolitical contexts in which we reside. It's obvious from this exercise that there are inequities in hastily adopted online learning for disadvantaged students in Anglophone contexts, particularly those who were reliant on attending campus for computers and internet access. But globally, there are both similar and different concerns for HE. In South Africa, for example, Czerniewicz et al (2020) have reported how the pandemic has revealed and exacerbates inequalities:

> *This enforced visibility has made the covert overt:* the lockdown has forced us to look much closer to where our students are, where they are positioned, what resources they have, what opportunities to engage in teaching and learning. And we cannot unsee these differences, whether on or off-campus*. Enforced visibility places a*

renewed focus on contextual realities and students' lived experiences. It forces us to critically consider aspects conducive for teaching and learning without contributing to new forms of digital exclusion... The pandemic and ERTL [Emergency Response Teaching and Learning] have revealed many of the causal mechanisms perpetuating inequality such as allowing students who did not have sustainable and affordable access to further fall behind (distantiation) and being excluded. Moreover, an already hierarchised teaching and learning context became further hierarchised. Students and staff are facing exploitation, not only through the colonisation of teaching and learning spaces by commercial providers to which many institutions have turned, but also through the increasing data gaze of educational technology and erosion of privacy and data sovereignty that were of concern prior to the pivot online.

Czerniewicz and colleagues suggest that there is a need to invest in a new ethics of care, and 'in contrast to the entrepreneurial hype of COVID-19 EdTech companies' innovation speak, there is an opportunity in the moment for genuine equity-focused innovation, policymaking, provision and pedagogy'. Indeed, just as the pandemic presents the edtech industry with a moment to disrupt and reimagine the future of HE, HE systems themselves have an opportunity to reimagine what a more equal system looks like, and to define and regulate edtech's role in such alternative imaginaries.

Conclusions and Recommendations

This report has detailed how imaginaries of a highly digitalised and datafied HE sector have begun to materialise in private sector and commercial activities during the COVID-19 pandemic. We have documented how the pivot to online learning during the pandemic has been framed both as an extraordinary emergency measure and an opportunity to establish a new 'digital normalcy' in HE. Many private and commercial organisations already operated at scale within the HE sector prior to COVID-19, but from what we have observed, we see a post-pandemic HE landscape that is increasingly privatised, commercialised, digitalised and datafied.

Private actors such as consultancies, finance companies and international bodies, as well as commercial education businesses and technology organisations are leading the charge on reimagining HE. While it is unclear yet whether the activities documented here will lead to lasting long term changes, we wonder if we are seeing a particular evolutionary leap in the ways that HE is structured. We see the potential growth of a direct-to-student-consumer model of learning, where both public and private providers are consumed by a Netflix mentality. Degree provision is already increasingly outsourced to commercial platform partners, and new private 'challenger' universities are appearing. The 'Big Tech' companies promise cloud infrastructure for long-term hybrid education, including data analytics for student performance monitoring and 'hyperpersonalised' automated intervention. The AI 'robot teacher' is being prepared as a nonhuman pedagogue that can work in programmed teaching and learning environments. Companies and HE institutions alike are asking such questions as how might we best unbundle degrees, stream learning on demand, or offer micro-credentials for immediate workplace upskilling?

While these examples indicate only one possible future, our report has documented a series of emerging tensions that will be central to any debate about HE learning after the pandemic has passed: tensions over the proclaimed purpose of education; over the organisation of pedagogic relations between students and educators; over the types of knowledge and skills that can or should be learnt within HE settings; and over the actors that have authority to settle those tensions. Perhaps most pressingly, the increasing privatisation and commercialisation activity we have observed raises issues over whether higher education is

understood as a sector that serves social, political, cultural and economic purposes, as a central institution of democracy, or whether it is perceived more instrumentally as an engine for producing measurable learning performance and associated workforce productivity gains.

Our key recommendation is that HE stakeholders including academic staff, students, and the unions that represent them should work urgently and collegially to define alternative imaginaries that can guide post-pandemic recovery of HE. In a 'manifesto' on 'transforming higher education,' Ashwin (2020) argues that HE has become dominated by the economic argument that the ultimate purpose of a degree is employability - as has been demonstrated by the rapid political emphasis on online HE as a route to post-coronavirus productivity and economic recovery. By contrast, he suggests, the purpose of a higher education is to bring students into a transformational relationship to professional and/ or disciplinary knowledge that changes their sense of who they are, how they understand the world, and what they can do to change it. Likewise, in their 'manifesto for teaching online', Bayne et al (2020) counter the impoverished techno-instrumentalist vision of education advanced by corporate and governmental edtech actors in HE, which tends to focus on technology as an inevitable solution to the problems surrounding education and educators, and suggest generative, reflective, creative and critical approaches to thinking about remote or distance forms of higher education. Connell (2019), too, recently outlined a vision for a 'good university' in which the forces of corporate culture, academic capitalism and performative managerialism are rejected in favour of democratic, engaged, creative, and sustainable practices. These manifestos demonstrate alternative ways of reimagining HE in the context of COVID-19 and beyond. The 'Post-pandemic university network' based in the UK has also begun publishing provocations and running conferences aimed at stimulating alternative, educator-led thinking about HE after the pandemic.[161] Such networks and manifestos are important reminders of the wealth of experience and professional expertise in the HE sector, and of the need for robust, critical and research-informed alternative imaginaries centred on recognising the purposes of higher education as a force of personal, professional and intellectual development, and as a social and public good (Analogue University 2018).

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161   Post-Pandemic University Network. 2020. The post pandemic university. https://postpandemicuniversity.net/about/.

Research recommendations

The creation of alternative imaginaries of HE should be informed by previous and new research. We recommend that critical lines for further inquiry should include:

- Detailed studies of key actors in the expanding global HE industry, seeking to understand their funding and revenue generation models, their visions and aspirations for the future of the sector, and the ways they attempt to materialise such imaginaries in technical development, marketing, and customer relationship management.

- Critical analyses of the expanding role of global technology corporations in HE, such as Alibaba, Amazon, Google and Microsoft, inquiring into their business models in the education sector, their data processing and privacy policies, and their institutional effects on customer or partner organisations.

- Empirical field studies of educational technologies in action in HE, interrogating the ways edtech reconfigures important functions of teaching and administration, such as the shaping of pedagogy according to technical templates and the assessment of students through in-built data analytics.

- Comparative policy analyses of emergency multisector policy arrangements and their impacts, such as the ways national or regional ministries of education utilise expertise from international organisations, and how consultancies work with governments to develop strategies and policies supportive of digital transformation in HE.

- Media and discourse analysis of the production of HE imaginaries across sectors including business, government, consultancy, and the press, articulating and comparing the construction and presentation of different HE futures, their intended audiences and impacts.

- Studies of the effects of online learning on student experience, utilising large-scale quantitative survey data and qualitative interviews and focus groups to elicit detailed, contextualised accounts of the impact of digital education on students.

- Research on the changing labour conditions of HE staff, using a mixed methods approach of quantitative surveys and qualitative interviewing to report on the effects of digitalisation and datafication on aspects of educators' work, autonomy and academic freedom.
- Identification and exploration of best practices in terms of regulation and safeguards for digital teaching and learning, including research focusing on the creation of standards and ethics frameworks which assesses their appropriateness and adequacy in relation to widespread digitalisation and datafication of HE.

Role of unions

Education International members must continue to debate the appropriate intensity of privatisation and commercialisation in education. In particular unions should consider how the evolving HE landscape in their own geographical region is changing workplace conditions and the professional status of academics, teachers and instructors. We are aware that this report is focused on the macro socio-political context of HE privatisation – and is mostly Anglophone in nature. There will be important regional differences and intricacies in how HE privatisation and commercialisation are playing out, and it is important to understand these and act accordingly. It is important for regional contexts to support vernacular research agendas that might provide evidence-informed understanding for member advocacy and union action. Across the globe, we see a pressing need to support the freedom of HE employees and their right to participate in the formulation and implementation of institutional policies around teaching and learning, and the extent to which these are privatised. Moreover, we see unions playing a critical role in promoting greater regulation of private providers as well as the safeguarding of staff and student privacy. Unions have a critical role to play in advocating what they imagine the future of HE to be, and how this vision might promote the right to education for all persons around the world.

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EdTech

Pandemic Privatisation in Higher Education: Edtech & University Reform

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Head office

Education International represents organisations of teachers and other education employees across the globe. It is the world's largest federation of unions and associations, representing thirty million education employees in about four hundred organisations in one hundred and seventy countries and territories, across the globe. Education International unites teachers and education employees.