Author's pre-publication copy. Please note that the typography and layout of this chapter differs to the final published version. Reference:

Pachler, N. (2022). Unbundling and Aggregation: Adapting Higher Education for Lifelong Learning to the New Skills Agenda and to Digital Transformation. In: Evans, K., Lee, W.O., Markowitsch, J., Zukas, M. (eds) Third International Handbook of Lifelong Learning. Springer International Handbooks of Education. Springer, Cham. https://doi.org/10.1007/978-3-030-67930-9_36-1

Unbundling and aggregation: adapting higher education for lifelong learning to the new skills agenda and to digital transformation

Norbert Pachler

Abstract

With reference to a range of recent publications, this chapter initially explores profound changes in the world of work and careers paying particular attention to the digital transformation of economic life by the increased use of AI and automation and through 'gig-fication' linked to platformization. The chapter then explores the impact of these developments on the nature and organisation of learning, specifically skills, vocationally and occupationally orientated lifelong learning as well as the impact on types of provision, often new, frequently venture capital funded and education technology powered, which are transforming the lifelong education market offering genuine competition through alternatives to traditional offerings in the context of an emerging change in perceptions of return on investment in formal, higher education credentials in an increasingly marketized higher education system.
The chapter discusses how this transformation not only focuses on a government-sponsored 'skills-turn' in terms of content and curriculum, given the growing impetus of aligning programs and credentials to labour market needs; it also discusses modes of online, blended and just-in-time delivery which address the increasing demand for easier opportunities for engagement and re-engagement, to support a non-linear career continuum and to create shorter learning opportunities that respond to the growing need for upskilling, reskilling and retraining; and it discusses provision based on new business models such as revenue share arrangements between formal education providers and their commercial partners or freemium models in which basic limited features are offered to users at no cost with supplemental or advanced features being charged for; it problematises new education architectures characterised by unbundling of services such as tuition and campus-based experiences and of courses into microcredentials, competency-based and work-integrated learning, nano-degrees and curated degrees; as well as cross-institutional aggregation models with partner and/or competitor institutions through so-called 'marketplaces'.
The chapter furthermore explores the role of multinational professional service networks in shaping these new market opportunities for the purposes of commercial exploitation in a global marketplace and it provides an overview of pertinent critiques offered by the higher education studies and lifelong learning literature.
The chapter also reflects briefly on how the impact of COVID has accelerated the need for action because of the way the pandemic has accelerated digitisation in higher education and revolutionised an understanding of affordances as well as student expectations.

Transformation of the world of work and careers and the platformisation of economic life

Recent years have witnessed a proliferation of reports on the ongoing and predicted transformations to the world of work and careers and attendant implications for education systems (e.g. Barber, Donnelly and Rizvi, 2013; Biddle & Cavanough, 2019; Bughin, Hazan, Lund, Dahlström, Wiesinger & Subramaniam, 2018; Centre for the New Economy and Society, 2018; Desire2Learn, 2018, 2020; European Commission/EACEA/Eurydice, 2021; GetSmarter, 2020; Government Office for Science, 2017; Institute for the Future, 2017; McKinsey Global Institute, 2017; PwC, 2018; Schmidt, 2017; World Economic Forum, 2020; World Economic Forum / PwC, 2021). With explicit or implicit reference to the so-called 'Fourth Industrial Revolution' (Schwab, 2016), they set out how the convergence of disruptive technologies impacts on the types and nature of jobs and career structures available and how it hastens the obsolescence of certain skills. These publications problematise the implications of an increasing move from traditional to on-demand and transient

employment in the 'gig economy' with its attendant gain in flexibility for employees but concurrent loss in structure, training opportunities and protection whilst at the same time the need for quick adaptation and continuous enhancement are a key requirement for ongoing success.

Most recently, COVID-19 has brought into sharp relief the importance of physical proximity as a determinant factor for the future of work with an analysis by the McKinsey Global Institute (Lund et al., 2021) distinguishing five physical attributes: closeness to customers or co-workers; frequency of human interaction required; relative stability of the set of colleagues interacted with; indoor or outdoor location of the work; and the requirement for on-site presence. The intensity of the level of proximity is deemed by the report to determine the level of potential disruption. And, COVID-19 accelerated existing trends around (1) remote working with implications for transport, retail and food services in urban contexts; (2) digitisation through growth in e-commerce and the 'delivery economy'; and (3) automation linked to investment in AI all with impact on the share of employment in low-wage occupations and the resultant need for job switching (Lund et al., 2021; Yao, 2020). Lund et al. (2021) predict an increase of occupational transitions by as much as 25% by 2030 and a shift in labour demand across occupations away from office support, customer service sales, production, food services and mechanical installation and repair to business and legal, transportation services, STEM workers, health professionals, health aides, technicians and wellness. This, they conclude, will require a digital infrastructure that enables faster reskilling and innovation in new worker benefits and support mechanisms.

Yao (2020) considers the biggest implication of the shift to remote work to be the increasingly distributed and free-lance based nature of work with wide-ranging implications for employees as well as employers. He points out that the dominant paradigm was that of structural centralisation and geographical concentration characterised by cultural proximity linked to 'shared local-ness' with a paradigm shift towards geographical, temporal and structural distribution (what he calls the 'gig-fication of the workforce') being enabled by technological transformation. In a recent report, the Friedrich-Ebert-Stiftung (Schmidt, 2017) problematised the trade-offs between the increased flexibility afforded by a more distributed model of work by discussing the potential and real downsides beyond the cultural arguments (team bonding, greater equality in accessing resources, facilitation of spontaneous interactions) delineated by Yao (2020). For an in-depth discussion of how digital labour platforms transform the world of work, see also International Labour Organisation, 2021. The report by the Friedrich-Ebert-Stiftung (Schmidt, 2017) stresses the increase in the level of risk attendant to working as independent contractor; downward pressure on wages; and lack of social security with the benefits of an on-demand workforce coming at the cost of precarious working conditions. It shows how what it calls the 'sharing economy' and 'platform economy' are in the ascendancy. They are underpinned by large digital platforms that don't focus on the common good but on the commercial coordination of services offered by private individuals (pp. 2-3). The report distinguishes three categories of digital labour: 'cloud work' (non-location-based tasks that can be done remotely via the internet), 'crowd work' (web-based labour undertaken by an undefined group of people) and 'gig work' (location-based digital labour, time-specific undertaken by specific people frequently in the areas of accommodation; transportation and delivery services; household and personal services) (p. 5). Whilst the discussion focuses mainly on the political challenges of crowd and gig work in relation to the common good and social policy, the report also raises important questions pertaining to workforce planning and related education policy. It discusses how the benefits of flexibility and the comparatively low entry barriers, provided the terms of service are accepted and a suitable internet connection is in place, come at the cost of what the report calls 'the Tayloristic breakdown of what were once occupations into their smallest possible components" with "jobs (becoming) projects, then gigs and eventually microtasks" and work process being constantly data tracked (p. 13). Whilst this potentially provides significant opportunities for new entrants from outside conventional career paths, without particular education and certification

profiles or without prior work experience (of particular kinds), it raises important issues around cumulative effects on quality, ethics, levels of preparedness of freelance workers and, importantly, the nature of educational provision best suited to prepare and support workers for employability in this changing landscape such as a strong focus on employability and entrepreneurship.

A quick look at the phenomenon of platformisation seems instructive at this point. Poell, Nieborg and van Dijck (2019) offer a useful multidisciplinary discussion of platformisation trying to combine in particular perspectives of platforms as markets as well as computational infrastructures (see also Nieborg and Poell, 2018). They put forward the following definition: "platforms as (re-)programmable digital infrastructures that facilitate and shape personalised interactions among end-users and complementors, organised through the systematic collection, algorithmic processing, monetisation, and circulation of data" (p. 3). In addition, they stress the importance of a cultural studies perspective in order to understand emerging perspectives on labour around platform markets and how social practices are being conceptualised around platforms as these, they argue, shape data infrastructures, markets and governance frameworks (p. 5). According to Poell, Nieborg and van Dijck (p. 6), the phenomenon of datafication is particularly important as platforms transform human interactions into data in ways that have historically not been possible: "rating, paying, searching, watching, talking, friending, dating, driving, walking etc" and which are being governed by particular interfaces and policies, aggregated and processed by algorithms about whose criteria for sorting and privileging users often know precious little. For an in-depth critical analysis of the political economy of platform learning with a particular problematisation of value extraction, exploitation of labour, efficacy and inequality and imagination, see Means, 2018.

<u>The case of FinTech and of UK education policy</u>

To explore the implications for education as preparation for work and lifelong learning it seems helpful to look at one important sector of the economy, financial services, as an example. The independent Kalifa Review commissioned by the HM Treasury and published in 2021 is a useful reference point in this regard.
In addition to recommending a new regulatory framework for emerging technologies addressing issues around data, AI and the digitisation of financial services, the report diagnoses a skills deficit and a shortage of specialised talent and discusses the need to retrain and upskill with a particular focus on the specific needs of the Fintech sector including data, technology and business skills. The report estimates that 90% of the UK workforce will need to be reskilled by 2030 with 5 million workers requiring radical job change retraining and 25 million reskilling in the light of evolving roles (p. 41). The Kalifa Review goes on to identify two key challenges: the cost of courses and a lack of clarity about credibility and nature of provision with existing policy mechanisms, in particular the apprenticeship levy, being deemed unsuitable because of the length of programmes relative to the speed and pace of changes in the sector (p. 42). To ameliorate the skills shortage, the report recommends providing access to short courses from high-quality education providers at low cost.

This recommendation is reflected in the recent UK government Skills White paper (DfE, 2021) which introduces the notion of a Lifelong Loan Entitlement, the equivalent of four years of post-18 education to promote alternatives to university degrees, and emphasises the importance of input from employers to improve productivity and fills skills gaps as well as strengthen flexibility and improve information about what training is on offer.

The 2017 UK Government Office for Science 'Future of skills and lifelong learning' report, working from the premise that skills and knowledge comprise a nation's human capital on which productivity as well as earnings and wellbeing depend, diagnoses poor basic skills in young adults in the UK, poor preparation of labour market entrants for the workforce, a large mismatch between skill supply and

demand, a 'low skills equilibrium', i.e. low-skilled jobs being matched by a low-skilled workforce as well as a situation in which participation in formal learning declines with age, adult learning is in overall decline and is disproportionally taken up by wealthier, more highly skilled individuals (pp. 7-8).

Technological disruption and digital transformation

Technological progress is an important driver for productivity growth and prosperity at societal level but, as the Government Office for Science report (2017) notes, it often necessitates disruptions in the workforce often with significant impact across a range at the level of the individual, the organisation as well as the system. As such it is also a significant driver for knowledge and skills requirements, reskilling and upskilling. Automation is a case in point with the McKinsey Global Institute (2017) report showing that jobs involving physical activities in highly predictable and structured environments as well as those that rely on data collection and data processing are most at risk with a differential existing across sectors. Occupations involving non-routine tasks and requiring higher-level cognitive or social intelligence, significant manual dexterity or some combination of both, on the other hand and according to Frey and Osborne (2014), are typically at lower risk. Advances in artificial intelligence may well change the risk levels to those occupations in due course.

A report by the Institute for the Future in 2017 discusses a range of sophisticated capabilities of what it terms emerging technologies of the day (robotics, AI and machine learning, virtual reality and augmented reality as well as cloud computing) and frames the challenge in terms of the need for human-machine partnership with significant implications and potential for individuals and organisations (p. 8) leading to increased 'collaboration and codependence' (p.16) with individuals bringing contextual intelligence, an entrepreneurial mindset, personal brand cultivation, automation literacy and computational sensemaking to the table (p. 18) and organisations business-driven security, elimination of latencies, algorithmic branding, diversification of the value of work and inspiration of innovation (p. 19) combining to significant workforce transformations.

In their recent paper, Poquet and de Laat (2021) discuss the potential impact of AI on lifelong learning within the wider context of the ongoing digitalisation of workplaces and educational settings. They explain (p. 1697) how AI is a game changer in that it brings dynamic affordances to learning, enables interaction with, not just mediation of human activity and, as a result, can affect and modify human cognitive and social processes and impact on identify formation. Poquet and de Laat (2021) argue (p. 1695) that technology needs to be afforded a foundational role in the (re)conceptualisation of lifelong learning around the development of capabilities given the extent to which it affects how adults enact and experience life and work.

From the above it can be seen that the ongoing changes to the world of work are profound, set to persist and are tightly linked to a continuing digital transformation of the entire economy and all aspects of society. These trends are impactful and sustained and not geographically, temporally or sectorally bound. As such, they are here to stay, are likely to accelerate and have significant implications for education across all phases including higher and lifelong education.

Wither an educational response to the transformation of work and careers

Education is widely considered to be a driver for upward intergenerational mobility at the level of the individual. As the Government Office for Science Report points out, the benefits of skills development and lifelong learning are multidimensional and impact the economy and society beyond benefits to the individual such as an increase in earning power, an increase in the probability

of continued employment, an increase in productivity, a positive impact on public health, reduced welfare dependency and higher tax revenues (2017, p. 20).

In recognition of the centrality of education and training, the recent World Economic Forum / PwC report (2021) sets out the following four-point action plan (pp. 8-9):

1. All stakeholders: Build a strong and interconnected ecosystem committed to a comprehensive upskilling agenda and give people the opportunity to participate
2. Government: Adopt an agile approach to driving national upskilling initiatives, working with business, non-profits and the education sector
3. Business: Anchor upskilling and workforce investment as a core business principle and make time-bound pledges to act
4. Education providers: Embrace the future of work as a source of reinvention to normalise lifelong learning for all.

In relation to 3 and 4 above, in a blog post of July 6, 2020 entitled 'Lifelong Learning' (https://www.socraticvc.com/posts/7-lifelong-learning), Akash Bajwa, a Fintech investor, reflects on the initiative by Microsoft to retrain 25 million people in digital skills (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/) and the acceleration of the trend away from manual jobs to jobs characterised by non-repetitive tasks with high cognitive skills in response to automation and digital transformation and the skills gap this trend is exposing in the workforce, particularly in ICT professionals. This, according to Bajwa, provides an opportunity to re-examine what higher education has to offer in terms of preparation for the jobs of the future. He goes on to describe twelve provisional categories of provision in the lifelong education market with indicative lists of providers, many venture-backed EdTech start-ups, as well as related start-up ideas. The categories include employee education; tech bootcamps; career accelerators; income share agreements; talent investors and company builders; alternative MBAs; and venture capital fellowships. As can be seen, there exists a wide range of lateral entrepreneurial thinking in the field of EdTech which throws into sharp relief the extent to which formal tertiary and higher education can be deemed to be vulnerable to disruption by digital transformation and to competition from alternative business and operating models.
Critics view such developments as examples as the effects of a 'servant economy' (Gorz, 1989) in which "technology fuels a radical bifurcation between elites and the rest": "Platform learning finds structural synergy with labor platforms that operate by connecting on-demand workers who operate as independent contractors to on-demand services" (p. 329).

The onus, it is argued here, is on formal education providers to respond to the existing and predicted changes to the world of work and careers. In this chapter, the focus will be on the role of universities and their provision in the areas of formal, accredited, and non-formal, non-certificated, learning rather than on informal learning which frequently tends to be non-intentional and non-structured but is a very important, arguably the predominant dimension of lifelong learning despite what prevailing policy discourses might have one believe. For a discussion of the latter, particularly in the context of the affordances of dynamic technologies, see Poquet and de Laat (2021, pp. 1703-05)

Indeed, there have been a number of attempts of late by multinational professional service networks, in particular KPMG (2020) and EY (2018), to set out advice on, and frameworks for university transformation as some critics argue to prepare the ground for commercial exploitation (see e.g. Lewis and Shore, 2019). The KPMG report provides an analysis of the challenges faced by universities to operate in an increasingly hostile climate in public perception and policy characterised by a sharp rise in costs, decrease in the earning's premium, a perceived decrease in

return on investment in education, limited ability in producing productivity gains, technological change driving new types of provision, the need for carbon neutrality in operations, rising student expectations, increasing competition from non-traditional entrants and new modes of delivery, lack of ability to meet the expectations of employers around job-readiness, etc. Against this background, KPMG recommend transformation mainly in relation to new capabilities around the following strategic features: borderless; shorter courses and degrees; digitally native cohorts; experiential learning; lifelong learning; competing at scale; and/or lifestyle integration (p. 15). And, they recommend the development of the following eight critical capabilities: insight driven strategies and actions; innovative products and services; experience centric by design; seamless interactions and commerce; responsive operations and supply chain; aligned and empowered workforce; digitally enabled technology architecture; and integrated partner and alliance ecosystem (p. 16). Such reports and their analysis are not without their critics: Lewis and Shore (2019), for example, refer to other publications in the genre, such as Barber, Donnelly and Rizvi (2013) or Bokor (2012), as 'utilising the language of crisis capitalism', 'constituency building' or 'prosaic market-making' (p. 21). Nevertheless, the reports recommend playbooks offering specific suggestions based on broadly accepted diagnoses of changing market conditions.

In their recent-edited collection, the Harvard Graduate School of Education team Dede and Richards (2020) set out a range of new models of lifelong learning in the digital economy eye-catchingly entitled 'The 60-year curriculum' reflecting the fact that people will work longer and in an increasingly rapidly changing skills environments which raises questions about the extent to which a university degree can and does prepare graduates for a life-time of work in numerous jobs across a number of careers or as freelancer in the platform economy. They argue that the current educational architecture (i.e. the type of provision and employment-focused curricula available) does not sufficiently support the new context of multiple careers. The book captures this transformation under the banner 'from a lifetime career to a lifetime of careers' (Richards, 2020, p. 146). A key change to the educational architecture proposed by Dede and Richards is a move from intermittent and episodic to continuous provision in order to provide lifelong learning in support of transitions and relationships through and across careers as well as to add psychological and dispositional dimensions to help navigate uncertainty and turbulence to a focus on knowledge and skills. Of particular importance in the educational response to the changes to work and careers is long-term capacity building, "enhancing students' interpersonal and intrapersonal skills for a lifetime of flexible adaptation and creative innovation" (Dede, 2020, p. 3).

The question facing universities is, therefore, how to configure themselves in a new global marketplace, to maintain quality standards, defend their positions and thrive in this new environment. Jonathan Grant, former Vice-Principal (Service) at King's College London, finds it likely that in their current form universities will not be sustainable, without their "privileged and protectionist position in the market for higher education" (p. 46). In his recent book he argues (Grant, 2021) that what he calls, 'new power learning' will have profound impacts on how accreditation happens and where value resides in the higher education system. In this way, the new and evolving forms of learning will not only impact on the public purpose of universities as the 'holders of knowledge' but also impact the very nature of the academy. (p. 46) Grant's analysis speaks to questions around the extent to which university brands and degrees will continue to have a strong signalling effect to employers and workforce entrants, in terms of their ability to prepare students for employment effectively and to represent value for money and offer an earnings advantage, particularly in a context of increasing tuition fees. Bhattacharya and Percy (2021, p. 6) among other things recommend the encouragement of shorter, more modular courses and the ability to try out or change courses more easily without dumbing down on the academic rigour, greater investment in adult education and a greater focus on hiring practices that emphasise

demonstrable skills in order to guide learners better towards education provision that positively enhanced their abilities and earning potential.

The higher education sector will need to continually review how best to support students by providing a range of opportunities from full flexible programmes to bite-sized learning that enable continuous upskilling and reskilling to ensure continued employability and strengthen students' trajectories across multiple careers across their lifetime. Although challenging, this is also an opportunity to improve equity by becoming more accessible to students from more diverse backgrounds and educational experiences. The doubtfulness of formal qualification systems being able to offer a credible and effective response to the reskilling and upskilling challenge is well documented, particularly in the context of the associated cost burden of traditional qualifications to students and/or the state, what Carpentier (2018) calls 'public-private substitution'.

Microcredentials

Building on MOOCs which have provided an affordable alternative to formal education to an unlimited number of participants over the last decade often around access to unbundled and repurposed existing material linked to user forums or social media discussion, micro-credentials emerged in recent years as a way of certifying "assessed learning that is additional, alternate, complementary to or a formal component of a formal qualification" (Oliver, 2019, p. i).
With reference to the OECD Program for the International Assessment of Adult Competencies (PIAAC), Oliver (pp. 2-3) diagnoses a deficit in voluntary engagement with non-formal education in selected OECD countries, that, according to Work-Related Training and Adult Learning data from Australia, participation in non-formal education, work-related training and personal interest learning had decreased and that learners faced significant barriers to engagement such as work-load, cost/financial resource, personal reasons and lack of availability of provision. From an Australian perspective, she also discusses the challenges associated with formal qualifications in relation to the future of work which include time to completion, relative lack of acknowledgement of partial completion, limited recognition of prior learning in terms of credits, difficulty in judging quality and value signals, a lack of clarity of learning outcomes and issues around the opacity of qualification documentation (p. 8). Microcredentials are perceived as a potential affordable solution to signal attainment of skills and competencies or certification of experience or technical expertise linked to the workplace that either stands alone or interacts with formal qualifications through 'stackability', particularly where they focus on work-integrated learning around industry-aligned curricula and employer validation of quality. Oliver argues for an interoperable system in which formal and non-formal learning work in tandem in support of the recognition that lifelong learning is seen to lead to 'healthier, happier societies and robust economies' (p. 31).

ContactNorth (2020) explores microcredentials from a Canadian perspective but also against the background of the skills agenda. They stress the focus of microcredentials on specific skills or capabilities in very specific fields and the inclusion of rigorous, formal assessment. The report explored benefits for learners and, among other things such as flexibility and speed of access to learning on demand identifies the ability to map a personal learning programme and learning choices from a range of providers (p. 4). For training providers, the ability to experiment and take calculated risk with models for teaching, learning, assessment and delivery as well as links with employers and professional bodies (p. 5).

A team from the National Institute for Digital Learning, Dublin City University, led by Mark Brown (Brown et al., 2021) developed the chart in Figure 1 to map out the emerging credentials landscape ostensibly differentiating bundled from unbundled credentials and credit-bearing from non-credit bearing.

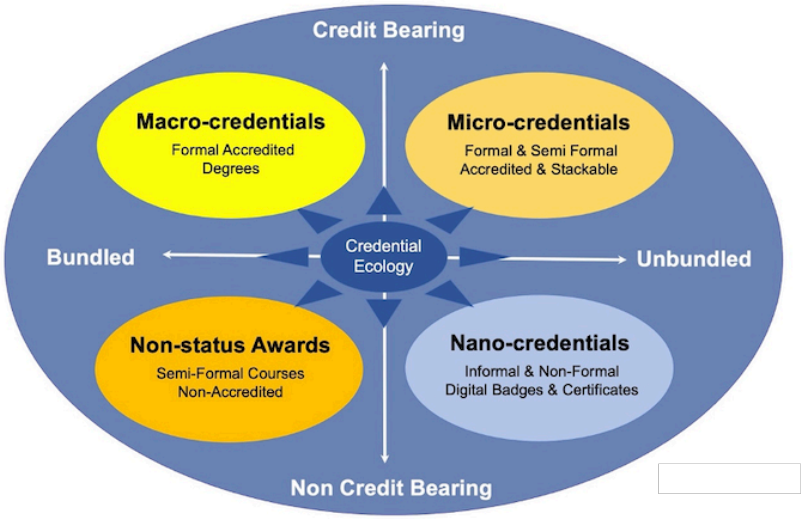

Figure 1: The new credential ecology (Source: Brown et al. 2021, p. 232, licensed under a Creative Commons Attribution ShareAlike 4.0 International License)

Brown et al. (2021, p. 235) consider microcredentials a way of meeting the projected growth in demand for higher education worldwide and as an antidote to the no longer fit for purpose current credentials system despite pointing out that, in the words of the Colleges & Institutes Canada (2021, p. 12), according to some, microcredentials "remain a solution looking for a problem".

Microcredentials, with their strong skills and competency orientation around industry and business partnerships, can be seen to be linked to a number of developmental trajectories in higher education policy and practice such as a considerable strengthening of employability-related activities in support of the mandate of universities to prepare students for effective and meaningful participation in adult life and the world of work, particularly in the context of increasing public debates about the value for money of universities and the value added to society, the common good and the economy in the costed of sharply rising costs to students and tax payers.

There is not the space here to problematise the policy debate much further apart from drawing attention to a recent in-depth analysis of the 'employability mandate' of universities by Komljenovic (2019) with reference to a large social media platform, LinkedIn, by way of a powerful illustration of pertinent issues not just in relation to the platformisation of higher education and learning but also specifically the context in which microcredentials play out in relation to it. Komljenovic's analysis clearly shows how HE actors, students and institutions, "are becoming prosumers as they are entangled in data markets, and as the data they produce is monetised and repackaged to become governing devices for their own sector" (p. 39). In engaging actively with employability related social media they unwittingly contribute to the reframing of meanings in their sector about quality of institutions, their graduates and their degrees as well as outcomes in relation to employment (p. 39). And, in so doing, they enable "platforms with opportunities and restraints of its infrastructure change the conditions for academic knowledge production and credentialization" (p. 39). It shows how a social media platform "lubricates an already strong policy and public focus on graduate employability and places universities in a different position to prove their place in society" (p. 40). Komljenovic's contribution to the debate also "demonstrates clearly how the digital economy is being entangled in the material HE economy, to such an extent that it is now structuring it" (p. 40).

Liberatory alternatives?

The fact that this is a contested space is illustrated, for example, by the contribution to the debate by Carson (2021) who argues against the grain, certainly of UK policy markers, who demand an ever more employment and earnings metrics related focus in judging the value of a degree. In response to the ongoing transformations in the world of work and careers, Carson posits the need for a shift away from career preparation and disciplinary training, away from 'one-to-one correspondences' towards "students' ability to know themselves, what they can do and who they can be" (p. 2) which he sees embodies in the tradition of liberal arts education, namely "as both an intellectual and experiential preparation for a precarious world and to design a socially engaged praxis that can enable graduates to shape how the future unfolds" (p. 2). Carson also considers there to be an urgent need to prepare students to "understand, critique and confront the new economic formation known as cognitive capitalism that will structure their precarity" (p. 2) and "to supplant the simple student-as-consumer instrumental model of a neoliberal education with a more complex and equitable student-as-citizen-producer model" (p. 6) prepared to intervene in the world entrepreneurially, culturally and/or intellectually (p. 8).

Amsler and Facer (2017) also discuss the need for the exploration of alternative educational future orientations and the need of contesting what they call with reference to Adams, Murphy and Clarke (2009), 'anticipatory regimes' in education. This, they note, describes a particular disposition towards the future "which is governed explicitly by the 'injunction to characterize and inhabit degrees and kinds of uncertainty – adjusting ourselves to routinized likelihoods, hedged bets and probably outcomes'" (p. 9). In their interpretation of prevailing educational policy,

> the educational subject … is neither an active and unfinished learner nor maker of worlds. Anticipatory consciousness is colonized by the statistical calculation of the future, as defined teleologically on the basis of present performances, and by the disciplining of accountability to this future in the present. (p. 10)

In their paper they bemoan the "epistemological and practical foreclosure of spaces to contest and imagine a range of possible futures with and for children, teachers, schools and systems of organized learning" (p. 11) and they argue for pedagogical responses that resist these anticipatory regimes and allow room for "liberatory alternatives" (p. 12). As such they pose a challenge to the educational community to envision ways of emancipating (lifelong) learners from the dangers of 'foreclosure'.

Unbundling and commercialisation

An important longer-term development trajectory around the alignment of universities with contemporary economic requirements is that of unbundling. For an in-depth discussion see e.g. the preliminary report of the Institute-wide Task Force on the Future of MIT Education (2013) or Czerniewicz and Walji (2019).

McCowan (2017, p. 733), in a seminal paper on the topic, questions the desirability of 'disruptive innovation' linked to partnerships with the for-profit sector in the context of the provision of separate out of institutional functions and services. McCowan's paper distinguishes three forms of bundle: (1) consumers being forced to buy unwanted products (tie-in); (2) those bringing together constituent elements for time-saving or economic advantage (convenience); and (3) those in which constituent elements have a necessary or mutually beneficial relationship (interrelated) and expresses concern whether the financial benefits of unbundling will lead to an impoverishment (p. 745). McCowan notes that whilst unbundling can lead to an increase in individual choice, this has

implications on collective values and their fragmentation and universities' ability to promote the public good and their ability to promote affirmative action in relation to fairness, equity and social justice (p. 741). He also raises issues around sufficiency of learner support and a pedagogical orientation towards transmission which is seen to undermine the relational dimension of teaching and learning (p. 743).

In their take on the topic of unbundling and critique of Barber, Donnelly and Rizvi (2013) as 'ideological dogma', Lewis and Shore (2019, p. 12) see "the assets and economic rents bound up in the right to confer degrees and in the interdependencies, value chains and social synergies of public universities – research-based teaching, campus lives, integrated mass and elite education, and co-constitutive social and individual values" at stake in the process of market making. Market making from this perspective is seen as rent raiding and asset stripping, as financialisation of education, as politically, commercially and ideologically motivated evangelical constituency building driven by a desire to create opportunities for education, management services and finance capital including value-creating possibilities in making, financing, stabilising and regulating a new market economy (p. 21, 23).

In a rather more prosaic approach to the topic of unbundling, EY (2018) provide what they call a 'higher education business model canvass' (p. 5) against three overarching questions with various sub-questions (1) How to universities create value? (1a) Who are pour customers? (1b) What are the jobs to be done for customers? (1c) What products/services are we providing? (1d) How do customers get our services? (2) How do universities deliver value? (2a) How do we produce it? (2b) How do we distribute it? (2c) How do we support it? (2d) Who are our key partners and suppliers? And (3) How do universities capture value? (3a) What are our major investment? (3b) What is our revenue model? Against each of the sub-questions the report identifies potential areas of disruption linked to digital transformation which, according to the authors of the report, lend itself to / benefit from unbundling for optimisation.

In a third trajectory of higher education policy, microcredentials can be seen as part of is the restructuring of (UK) higher education according to the three logics of corporatisation, competitiveness and commercialisation characterised by a reworking of the boundaries around the "higher education-state-economy-civil society relation" (Robertson, 2010, p. 191). Komljenovic and Robertson (2016) describe this as the "dynamics of market-making" with their underlying ideological origins (neoliberalism, New Public Management), symptoms (competition, privatisation, commodification, trade) and manifestations (changing structures, strategies and social relations) (p. 623). Robertson (2010, p. 193) makes a particularly pertinent point around the need for higher education institutions to actively position themselves in this clearly ideationally, ideologically and politically contested space:

> (to) 'see' higher education in the UK at any moment as the outcome of a particular patterning of strategically-selected social relations constituted through economic and political imaginaries, with actors having differential capacities to strategically engage in, and re-organise, structures and strategies over different spatio-temporal horizons.

There is a growing literature documenting the increasing interest in the use of microcredentials as a purposeful response to addressing the skills gap and seeking to help shape the ecology to which they contribute including by raising awareness of their potential market rewards for example in the context of credit accumulation and stacking and advise governments, universities, employers, professional bodies and other stakeholders on desirable actions, amongst them an analytical report by the European Commission (Orr, Pupinis and Kirdulytè, 2020) two recent papers in the OECD Education Policy Perspectives series (Nos 39 and 40), various papers by Beverly Oliver, formerly at

Deakin University or by the National Institute for Digital Learning at Dublin City University and a 'conversation starter' by UNESCO (Oliver, 2021).

What the critics say

At the same time, there is a growing body of academic literature in the field of higher education studies critiquing the emergence of microcredentials. The three most recent and conceptually orientated are by Ralston (2021) and Wheelahan and Moodle (2021a, b).

Ralston (2021) bemoans the fact that microcredentials normally lack a general education component and are instead orientated towards employers' workforce needs (p. 85) and the loss of a rich educational experience inherent in an "ongoing and mutually edifying conversation" in which "teacher-scholars share new vocabularies, culture and dispositions to learn with their students" (p. 92). He considers "the modern microcredentialing craze is an outgrowth of a renascent movement repurpose universities as sites … for vocational training and workforce development" based on a transactional, profit-driven relationship between universities, clients and vendors (p. 94). In total Ralston (2021) enumerates 10 points of a postdigital-Deweyan critique (pp. 95-7) which leave no doubt about the author's perspective on whether microcredentials can be a legitimate component of any higher education institution's long-term strategy.

Wheelahan and Moodle (2021a) locate their critique of microcredentials within a wider critique of human capital theory which they contend (2021b, pp. 3-4) holds that education increases skills which in turn increases productivity and economic output: "learning equals earning" with qualifications signalling potential. Wheelahan and Moodle' s focus is on what they call 'homo economicus', "a market self who uses micro-credentials to invest in this or that set of skills in anticipating labour market requires" (p. 212). A similar point is made by Means (2018) with reference to Peters (2005) (see also Gerrard, 2014 and Hartley, 2007) who argues that the

> notion of learning as capital produces a new actuarial ethic of the self. With the withdrawal of the neoliberal state in providing social provision and labour protections, learning becomes a form of private investment and management, a new prudentialism that disciplines subjects to manage precarious employment and social fragmentation through competitive acquisition of education (p. 328).

Wheelahan and Moodle (2021a) view microcredentials as part of a narrative around 'genericism' in which individuals are framed as needing "to be ready for perpetual 'trainability', divorced from a core disciplinary or occupational focus and their associated identities" (p. 212). In particular, they are concerned about microcredentials weakening "relations of classification of knowledge and framing (the pacing, sequencing and evaluation) of knowledge" (p. 213) and their inherent perspective of learners as "rational, instrumental, self-maximizing actor(s) as the normative and taken-for-granted end-goal of education" (p. 216). In so doing, and with reference to Bernstein (1999), they problematise the inherent shift of risk from employers and/or society to individuals as freelancers and the shift in the cost of training and indirectly raise questions about the role of the employer, the private and public sectors in ongoing workforce development and human capital development in a context of an increase of freelance activity, frequent job changes and multiple career paths for individuals as well as who should carry the cost (see also Desire2Learn, 2018). In their most recent paper, Wheelahan and Moddle (2021b) frame microcredentials as reinforcing social relations of precariousness in the labour market and in society (p. 1) and represent an "outsourcing and cost-shifting of employers' internal professional development and training to individuals who must demonstrated that they are 'market-ready'" (p. 2). In their final analysis,

Wheelahan and Moodle (2021b, p. 15) consider microcredentials to contribute to the privatisation of education rather than to represent an opportunity for social inclusion and access.

Whither and educational response continued

From the above discussion two things are clear: (1) both 'exogenous' (through the involvement of venture capitalists and for-profits) and 'endogenous' (through neoliberal discourses linked to human capital theory and the introduction of business-related norms and practices) privatisation of public education (see Ball and Youdell, 2008) is happening apace; and (2) academics don't like either (see e.g. Czerniewicz et al., 2021).

The need for trade-offs between scalability and sustainability on the one hand and educational and pedagogical on the other will increasingly exist in the context of decision making in higher education and questions whither the introduction of microcredentials are an important case in point given the significant paradigmatic change to existing systems, practices, ways of working and policies they require and imply and the questions around the purpose of higher education they raise.

In order to be able to move on from what seems a rather polarised debate, empirical research into the efficacy of microcredentials seems urgently required in order to be able to understand whether they can fulfil the aspirations of individual upward social mobility and societal and economic need. Of these, there is currently very little (for an example see e.g. Giani and Fox, 2017, exploring whether stackable credentials reinforce existing stratifications by channelling under-represented students into short-term programmes).

In his opinion piece in Inside Higher Ed, Gallagher (2018) makes the very pertinent point that what is required is expansion, not replacement, i.e. that the focus should be on degrees and microcredentials and on enhancement of existing tertiary education provision instead of replacement of university-based postsecondary education first cycle degree programmes:

> We need high-quality educational and training options for those who truly don't want degrees. But such options cannot replace degrees, and we should not use them as an excuse to ignore the social and economic inequities that make us believe that we know who the deserving are in the first place or that "desiring" a college degree is a purely personal and unfettered choice. Our goal should be to expand access
> to high-quality degrees and alternative credentials to as many learners as possible -- ideally in ways that promote the integration of learning across a variety of lifelong learning experiences and credentials. (p. 4)

And with Gallagher (2028, p. 5) we conclude that what higher education should be aiming for are 'rebundled' universities which provide opportunities for degree and non-degree learning experiences and credentials and enable learners to "author their own coherent, integrated' lifelong "learning journeys" as well as, drawing on Carson (2021) attendant pedagogies that prepare learners for and enable them to develop dispositions towards agency and act on the world, in particular their own lifeworlds in the tradition of Habermas's social theory (see e.g. Habermas, 1981).

And in terms of the partnership of intelligent technologies in terms of cognition for human development, we hold with Poquet and de Laat (2021, p. 1703):

> Firstly, the focus on performativity and increase of efficiency when human-machine task is performed, need to be accompanied by an understanding of how and if this partnership and task efficiency would extend human mastery, known to be linked to self-fulfilment and

opposite of deskilling. Secondly, any kind of learning is situated within contexts comprised of multiple economic, technological, social and individual psychological traits as tasks are accomplished in the contexts that embed the individual and the tool. Data collected by intelligent systems can offer additional insights into these contexts and advise about potential systemic challenges. Thirdly, self-regulation and freedom of choice in learning should set the tone for mindful and learner-driven engagement with intelligent technologies, in ways that would result in mastery, not just efficiency.

Concluding remarks

By way of closing, but also as an outlook, it seems important to offer also a different type of perspective on the future of lifelong learning by drawing attention to some of the sociotechnical tensions inherent, for example, in the consideration of microcredentials.
In a recent though piece, Selwyn (2021) asserts the need to move beyond what he calls 'technological solutionism' associated with the imagined virtues of digital transformation. Instead he argues for an engagement with four sociotechnical tensions: (1) of environmental sustainability, (2) between commercial and the commons, (3) between inclusivity and exclusivity and (4) between personalisation and collectivism. Above all Selwyn argues for a "fundamental shift in educational understandings of what digital education can do – including questions of what value digital technology creates and at what cost" (p. 7) with a focus on provision that explicitly seeks to challenge structural inequality and are not designed for those who are already engaged and advantaged. With this we agree wholeheartedly and we consider it important for education, including higher and lifelong education, to find the right balance on the continuum between dystopian and utopian perspectives of digital technologies with a particular emphasis on sustainability and fair outcomes for all.

References

Adams, V., Murphy, M. and Clarke, A. (2009) Anticipation: technoscience, life, affect, temporality. In Subjectivity 28(1), pp. 246-265

Amsler, S. and Facer, K. (2017) Contesting anticipatory regimes in education: exploring alternative educational orientations to the future. In Futures 94(1), pp. 6-14

Ball, S. and Youdell, D. (2008) Hidden privatisation in public education. London: Institute of Education, University of London

Barber, M., Donnelly, K. and Rizvi, S. (2013) An avalanche is coming: Higher Education and the revolution ahead. London: Institute for Policy Research

Bernstein, B. (1999) Vertical and horizontal discourse: an essay. In British Journal of Sociology of Education 26(2), pp. 183-197

Bhattacharya, A. and Percy, C. (2021) Signal failure. How can we get more value and less waste from our education system? London: Social Market Foundation

Biddle, N. and Cavanough, E. (2019) Opportunities in change: responding to the future of work. The McKell Institute, Australian National University Centre for Social Research & Methods, Canberra

Bokor, J. (2012) University of the future: a thousand year old industry on the cusp of profound change. Australia: Ernst and Young.

Brown, M., Mhichil, M., Beirne, E. and Lochlainn, C. (2021) The global micro-credential landscape: charting a new credential ecology for lifelong learning. In Journal of Learning for Development 8(2), pp. 228-254

Bughin, J., Hazan, E., Lund, S., Dahlström, P., Wiesinger, A, and Subramaniam, A. (2018) Skill shift: Automation and the future of the workforce. McKinsey Global Institute

Carson, J. (2021) 'Re-thinking a Bachelor of Arts for the 21st Century precariat'. In Studies in Higher Education. Available at: https://doi.org/10.1080/03075079.2021.1916906

Carpentier, V. (2012) Public-private substitution in Higher Education: has cost sharing gone too far? In Higher Education Quarterly 66(4), pp. 363-390

Centre for the New Economy and Society (2018) The future of jobs report 2018. Insight report. World Economic Forum, Geneva

Colleges & Institutes Canada (2021) The status of microcredentials in Canadian colleges and institutes: environment scan report. Available at: https://www.collegesinstitutes.ca/policyfocus/micro-credentials/

ContactNorth (2020) Micro-credentials and the skills agenda. Twelve fundamental questions. Ontario

Czerniewicz, L., Mogliacci, R., Walji, S., Cliff, A., Swinnerton, B. and Morris. N. (2021) Academics teaching and learning at the nexus: unbundling, marketisation and digitisation in higher education. In Teaching in Higher Education DOI: 10.1080/13562517.2021.1876019

Czerniewicz, L. and Walji, S. (2019) Issues for universities using private companies for online education. Available at: https://open.uct.ac.za/bitstream/handle/11427/29813/Czerniewicz_Walji2019.pdf

Dede, C. (2020) Introduction: reconceptualising higher education and lifelong learning in the era of the synergistic digital economy. In Dede, C. and Richards, J. (eds) The 60-Year curriculum: new models for lifelong learning in the digital economy. New York: Routledge, pp. 1-24

Dede, C. and Richards, J. (2020) (eds) The 60-Year curriculum: new models for lifelong learning in the digital economy. New York: Routledge

Desire2Learn (2020) The future of lifelong learning. Designing for a learning-integrated life. London

Desire2Learn (2018) The future of work and learning in the age of the 4th Industrial Revolution. London

DfE (2021) Skills for Jobs: Lifelong Learning for Opportunity and Growth. London

European Commission/EACEA/Eurydice (2021) Adult education and training in Europe: building inclusive pathways to skills and qualifications. Eurydice Report. Luxembourg: Publications Office of the European Union

EY (2018) Can the universities of today lead learning for tomorrow? The university of the Future.

Frey, C. and Osbourne, M. (2014) Agiletown: the relentless march of technology and London's response. Deloitte

Gallagher, C. (2018) Colleges re-bound? Inside HE, June 13

Gerrard, J. (2014) All that is solid melts into work: self-work, the 'learning ethic' and the work ethic. In The Sociological Review 62(4), pp. 862-879

Giani, M. and Fox, H. (2017) Do stackable credentials reinforce stratification or promote upward mobility? An analysis of health professions pathways reform in a community college consortium. In Journal of Vocational Education & Training 69(1), pp. 100-122

GetSmarter (2020) The future of learning is here. Washington, DC

Gorz, A. (1989) Critique of economic reason. New York: Verso

Government Office for Science (2017) Future of skills & Lifelong learning. London

Grant, J. (2021) *The New Power University: The social purpose of higher education in the 21st century.* London: Pearson

Habermas, J. (1984) Reason and the Rationalization of Society, Volume 1 of The Theory of Communicative Action, English translation by Thomas McCarthy. Boston: Beacon Press (originally published in German in 1981).

Habermas, J. (1987) Lifeworld and System: A Critique of Functionalist Reason, Volume 2 of The Theory of Communicative Action, English translation by Thomas McCarthy. Boston: Beacon Press (originally published in German in 1981).

Hartley, D. (2007) Personalisation: the emerging 'revised' code of education? In Oxford Review 33(5), pp. 629-642

Institute for the Future (2017) The next era of human | machine partnerships. Emerging technologies' impact on society and work in 2030. Dell Technologies

Institute-wide Task Force on the Future of MIT Education (2013) Preliminary Report. Available at: http://web.mit.edu/future-report/TaskForceOnFutureOfMITEducation_PrelimReport.pdf

International Labour Organisation (2021) World employment and social outlook: the role of digital labour platforms in transforming the world of work. Geneva

Kalifa, R. (2021) Kalifa Review of UK Fintech. City of London & Innovate | Finance

Komljenovic, J. (2019) Linedin, platforming labour, and the new employment mandate for universities. In Globalisation, societies and education 17(1), pp. 28-43

KPMG (2020) The future of higher education in a disruptive world.

Lewis, N. and Shore, C. (2019) From unbundling to market making: reimagining, reassembling and reinventing the public university. In Globalisation, Societies and Education 17(1), pp. 11-27

Lund, S., Madgavkar, A., Manyika, J., Smit, S., Ellingrud, K., Meaney, M. and Robinson, O. (2021) The postpandemic economy: The future of work after COVID-19. McKinsey Global Institute

McCowan, T. (2017) Higher education, unbundling, and the end of the university as we know it. In Oxford Review of Education 43(6), pp. 733-748

McKinsey Global Institute (2017) Jobs lost, jobs gained: workforce transitions in a time of automation.

Means, A. (2018) Platform learning and on-demand labor: sociotechnical projections on the future of education and work. In Learning, Media and Technology 43(3), pp. 326-338

Nieborg, D. and Poell, T. (2018) The platformization of cultural production: theorizing the contingent cultural commodity. In new media& society 20(1), pp. 4275-4292

OECD (2021) Micro-credential innovations in higher education: who, what and why? OECD Education Policy Perspectives No. 39

OECD (2021) Quality and value of micro-credentials in higher education: preparing for the future. OECD Education Policy Perspectives No. 40

Oliver, B. (2021) A conversation starter: towards a common definition of micro-credentials. UNESCO

Oliver, B. (2019) Making micro-credentials work for learners, employers and providers. Deakin University

Orr, D., Pupinis, M. and Kirdulytè, G. (2020) Towards a European approach to micro-credentials: a study of practices and communalities in offering micro-credentials in European higher education. NESET Report, Luxembourg: Publications Office of the European Union

Peters, M. (2005) The new prudentialism in education: actuarial rationality and the entrepreneurial self. In Educational Theory 55(2), pp. 123-137

Poell, T., Nieborg, D. and van Dijck, J. (2019) Platformisation. In Internet Policy Review. Journal on internet regulation. 8(4). DOI: 10.14763/2019.4.1425

Poquet, O. and de Laat, M. (2021) Developing capabilities: lifelong learning in the age of AI. In British Journal of Educational Technology 52(4), pp. 1695-1708

PwC (2018) Workforce of the future. The competing forces shaping 2030.

Ralston, S. (2021) Higher Education's microcredentialing craze: a postdigital-Deweyan critique. In Postdigital Science and Education 3, pp. 83-101

Richards, J (2020) Assessment of the current state of the 60-year curriculum and research agenda for the future. In Dede, C. and Richards, J. (eds) The 60-Year curriculum: new models for lifelong learning in the digital economy. New York: Routledge, pp. 142-155

Robertson, S. (2010) Corporatisation, competitiveness, commercialisation: new logics in the globalising of UK higher education. In Globalisation, Societies and Education 8(2), pp. 191-203

Schmidt, F. (2017) Digital labour markets in the platform economy: mapping the political challenges of crowd work and gig work. Friedrich-Ebert-Stiftung, Bonn

Schwab, K. (2016) The Fourth Industrial Revolution. World Economic Forum

Selwyn, N. (2021) (Re)imaging the futures of lifelong learning: some sociotechnical tensions. UNESCO Institute for Lifelong Learning

Wheelahan, L. and Moodle, G. (2021a) Analysing micro-credentials in higher education: a Bernsteinian analysis. In Journal of Curriculum Studies 53(2), pp. 212-228

Wheelahan, L. and Moodle, G. (2021b) Gig qualifications for the gig economy: micro-credentials and the 'hungry mile'. In Higher Education. https://doi.org/10.1007/s10734-021-00742-3

World Economic Forum (2020) The future of jobs report 2020. Geneva. Available at: https://www.weforum.org/reports/the-future-of-jobs-report-2020

World Economic Forum / PwC (2021) Upskilling for shared prosperity. Insight report. Geneva. Available at: https://www.weforum.org/reports/66f2ea7f-4fd3-4e05-8313-888196373558

Yao, R. (2020) The future of work, fast-tracked by COVID-19: Remote work is here to stay, and the future of work will be distributed and automated. Available at: https://medium.com/ipg-media-lab/the-future-of-work-fast-tracked-by-covid-19-914e984b63f6