CHAPTER 2

The Rise of EdTech Platforms in Higher Education: Mapping Themes from Emerging Critical Literature

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Introduction

The COVID-19 pandemic posed a major challenge for universities as they had to rapidly switch to online teaching in order to provide continuity and consistency in their higher education (HE) offerings. Yet, restrictions on physical face-to-face teaching necessitated by the pandemic have

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also afforded the educational technology (EdTech) sector a unique opportunity for growth. Private sector EdTech firms had already incrementally extended their reach into universities since the 1990s with HE's uptake of Learning Management Systems (LMS), and since the 2010s with the development of massive open online courses (MOOCs). With the pandemic's onset, however, many complex questions that may have held back universities from engaging more with EdTech platform provider firms were set aside, along with concerns about the potentially problematic nature of involving more private actors in the HE sector. Rapid digitalisation of HE teaching seemed the only viable way universities could continue to deliver courses to students at the same time as having to vacate campus classrooms (Decuypere et al., 2021; Ivancheva et al., 2020). The pandemic enabled EdTech advocates to rehash earlier claims that digitalisation can indeed remedy some supposedly outdated, inflexible and inefficient approaches of traditional HE. This is seen, for instance, in the speculative ambitions of commercial commentators, optimistically projecting that worldwide investment in EdTech will double between 2020 and 2025, from an already significant US$227 to US$404 billion (HolonIQ, 2021a).

Critical perspectives in education literature have noted many potential issues associated with rising EdTech involvement in HE. They also highlight that little here is new. The game, many of its players and their agendas resemble market consolidation tactics by private firms. The potential for digitalisation of HE to cause new divisions of labour, due to modularisation and outsourcing of academic work, also mirrors trends of casualisation of conditions and worker rights in the rise of 'gig economy' work in other sectors of the economy (Ivancheva & Garvey, 2022). Increased platform dependence by universities has also been linked to workforce precaritisation, privacy issues and concerns about who benefits from students and learning being turned into data assets that are capitalised by private firms (Komljenovic, 2020; Martínez Guillem & Briziarelli, 2020; Ovetz, 2020). Such questions are not unique to the pandemic emergency teaching period. They have also been raised during earlier waves of university engagement with EdTech, for example around MOOCs, LMSs, and outsourcing of course delivery to private sector Online Programme Management (OPM) companies (Ivancheva et al., 2020; Langseth et al., 2019; Shanley et al., 2020).

Much literature on EdTech has been uncritically triumphalist, particularly in the early days of MOOCs (Selwyn & Gašević, 2020). This chapter

instead aims to provide an overview of critical perspectives and their key themes, to make sense more broadly of *how growing university engagement with EdTech might transform HE provision*. This is done through an extensive review and narrative synthesis of critical studies of HE digitalisation. We especially focus on works incorporating political economy, and framing EdTech less as a set of pedagogical innovations disconnected from the broader economy and more as a powerful form of 'platform capitalism'. This extensive qualitative review was conducted in disciplines such as education studies, anthropology, geography, sociology and cognate fields, where in-depth qualitative approaches are common. This is akin to what Gough et al. (2012) have labelled 'configurative reviews' which aim to 'identif[y] patterns provided by heterogeneity' (ibid.) and 'have the purpose of […] aiming to find sufficient cases to explore patterns and so are not necessarily attempting to be exhaustive in their searching' (ibid.). Our search strategy included database searches in Google Scholar and Scopus, inclusion of relevant literature already known by the authors and snowballing of relevant literature from items found through these two previous avenues.

Our focus is not on reaching some abstract notions of objectivity and replicability. Rather we aim for an in-depth interpretation of the sources to build dialogue between the different voices and contributions. The review is organised around themes that emerged from reading the selected literature (induction) in interaction with topics and debates that the authors were already aware of beforehand (deduction). This thematic approach differs from much EdTech literature that tends to organise reviews around the kind of technology used and can artificially isolate, for example, MOOCs, LMSs, OPMs or other EdTech from their broader societal and economic contexts. Instead, we attempt to provide a more comprehensive, critical review and synthesis of key themes across different dimensions of HE digitalisation.

In what follows, we first put our review into the context of rising digitalisation and marketisation of HE—something that is unevenly occurring across universities worldwide. We then outline a model of the critical themes we found in the literature and present these across several sections. This is followed by a closing discussion of what these themes collectively may mean for HE digitalisation prospects and challenges.

Rising EdTech in Context: HE Digitalisation and Marketisation

The context within which we seek critical perspectives on the rise of EdTech firms and their involvement with universities is one of rapid HE digitalisation and marketisation globally. As noted in Chapter 1 of this book, these processes are very uneven. There is more use of EdTech everywhere, but uneven access to a stable internet infrastructure produces rather different outcomes within and across countries. This transformation logic is often portrayed as follows:

> Framed as an agent of disruption, digital technology in education, or EdTech, is imagined as an unstoppable force of nature descending upon higher education. We are defenseless against it. We must adapt to what EdTech wants from us and embrace what it is doing to us. We have no choice. (Mirrlees & Alvi, 2019, p. 2)

This perhaps bleak vision of 'unstoppable' expansion of EdTech is common (see Costello et al., 2020; Marachi & Quill, 2020; Martínez Guillem & Briziarelli, 2020; Ovetz, 2020; The Analogue University, 2019; Williamson et al., 2020). However, Mirrlees and Alvi (2019) show that it is difficult to define what EdTech is exactly, and to determine how to connect it to the current stage of global capitalism. Almost every tool applied in education could be understood as EdTech. Like other contemporary tools, EdTech spans and integrates different technologies. It depends upon complex value-chains, and is inherently linked to broader political and economic processes (Mirrlees & Alvi, 2019). For our purposes, we will rely on the understandings emerging from the critical literature under review. We focus then on the software ecosystem used, typically composed of intertwined educational platforms (e.g. Blackboard, Canvas, Google Classroom, Moodle) and their platform providers (e.g. Blackboard Inc, Instructure, Alphabet, Moodle Community). Our critical discussion of EdTech is not merely focused on the tools and their insertion into the everyday life of HEIs, but also on the broader connections between the academic, pedagogical, institutional and economic spheres within which EdTech operates. We are concerned not only with the *how* but also the *why* of rising EdTech presence in HE, and the possible futures of *where* digital transformation of HE might be going.

Much critical literature links the rise of EdTech private sector business with global capitalist trends that enable private companies to provide services to universities (Martínez Guillem & Briziarelli, 2020; Mirrlees & Alvi, 2019; Williamson, 2019). We see EdTech then as part of what Williamson (2019) calls the 'HE space', which is being rebuilt under an overarching marketisation agenda driven by policymakers and education platform providers. Such EdTech involves the 'nuts and bolts' work of 'the practical, material, technical and discursive effort of market-making and maintenance' of platforms (Williamson, 2019, p. 9). This market-making endeavour includes supply-side processes, where EdTech firms attempt to re-frame norms and expectations around what education provision should be. It also involves demand-side processes that incentivise individualised, competitive personal cravings so that students feel a constant need for career development, professional development and lifelong learning, to keep their skills updated (Biesta, 2018).

Platform providers offer universities packaged 'solutions' embodying this dual instrumental nature, including MOOCs, OPMs and, mainly, LMSs. They meet demand but also induce it. They service the marketisation of the HE space, whilst also reinforcing it (Williamson, 2019, 2021). These solutions effectively redesign learning experiences into a more market-amenable logic. Just as traditional educational tools once controlled the bodies of students to produce state citizens (Foucault, 1995), EdTech turns today's students into lifelong learners (Biesta, 2018). It instils in them a restless, consumerist drive for relentless skill updating, and a feeling they must continually improve their competitiveness in labour markets or else become obsolete (Walshok, 2021).

These trends have been amplified by the pandemic. The pressure on universities was enormous, as there was a real risk of dramatic drops in student numbers if teaching did not continue digitally (Witze, 2020). This was a perfect storm and opened the way for radical institutional change in HE. Significant policy changes were implemented with often little consideration for long-term effects and with academics in a weak position to oppose or improve new 'emergency' policies.

Review of Key Themes

We now review nine key themes that emerged from our review of the critical literature on EdTech in HE. These exemplify key institutional and technical dimensions, and potentials and prospects around EdTech-related digital transformation of HE. Some themes include dynamics already given names in literature: *platformisation*, *learnification*, *datafication*, *modularisation*, *unbundling* and *assetisation*. For others, we use new labels: *crowdification*, *peer-to-peering*, and *skillisation & short-circuiting*.

Figure 2.1 shows how these themes interrelate. *Platformisation* and *learnification* act as meta-themes, under which the other sub-themes are grouped. On the left, we gather technological processes, conjoining digitalisation and marketisation, involving dynamic *platformisation* occurring in HE, also being inspired by broader platformisation processes in other sectors (McAfee & Brynjolfsson, 2017). The core of platformisation, we posit, is a process of *datafication*. This enables *assetisation*, powers *modularisation* and allows *crowdification* and *peer-to-peering* to emerge (explained in the more detailed thematic reviews later in this chapter). On the right is a non-technological, institutional process, *learnification* (see also Biesta, 2018), which we argue is essential to platformisation but also strengthened by the latter. *Learnification* provides a kind of ideological backbone for more abstract processes within this meta-theme, such as *unbundling* and *skillisation & short-circuiting*.

We should note several limitations of our approach. First, as Decuypere et al. (2021) note, any critical study of digital platforms in HE still faces epistemological difficulties and requires new theoretical frameworks to understand the multifaceted dynamics that are at work, as well as their potential effects. In other words, we are attempting to review a complex, evolving terrain. This review therefore does not aim to take a particular normative stance or to arrive at any summative assessment of the reviewed themes. Second, as noted in Chapter 1 of this book, we cannot assume these dynamics are universally prevalent. They are likely uneven and their implications across world regions, including the Nordic context, need further study, so that local contingencies and specificities are properly taken into account.

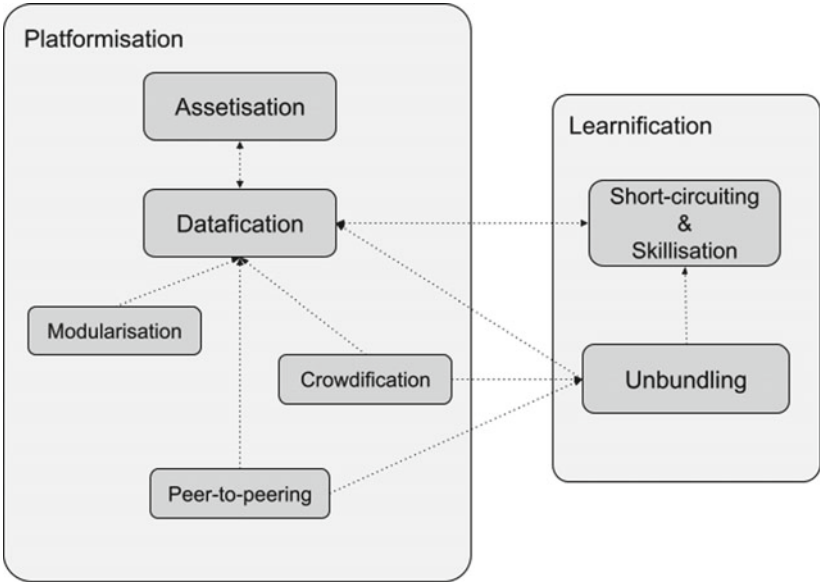

Fig. 2.1 A heuristic model to connect themes emerging from the EdTech critical literature

Meta-Theme 1: Platformisation or from Product to Platform

The first meta-theme in our review sees EdTech from a market perspective. Here, digital platforms are virtual spaces for transit of digital information goods, replacing typical product consumption mechanisms. Three inherent traits are that these goods can be reproduced with negligible costs, each copy is always an exact replica, and their distribution is practically instantaneous, regardless of distance (McAfee & Brynjolfsson, 2017). The rise of EdTech platforms can be similarly conceptualised. HE knowledge in digital format is, at least in principle, perfectly replicable and perfectly transmissible. Thus, when digitised, these traits enable platform-based marketisation logics in HE. This logic mirrors the growth of online music platforms such as Spotify or Apple Music that have made trade in physical music commodities (e.g. LP records or CDs) obsolete, replacing it with the consumption of individual digital tracks within a platform environment. McAfee and Brynjolfsson (2017) describe this as transformation

from product to platform. In a similar manner, once recorded, a university lecture, can be endlessly and relatively cheaply shared on a platform. This seemingly makes it senseless, from a strictly market standpoint, for any student to pay to consume this same material being repeated later in a physical setting—or to purchase inferior content provided by competing university teachers elsewhere.

Another sub-theme here is the effects of such platformisation on the behaviour of platform users. Decuypere et al. (2021) explain these by describing three roles played by platforms. First, platforms work like urban architectures, providing spaces (interfaces) for user interactions. These are both human-to-software or navigation (through graphical user interfaces or GUIs) and software-to-software or interoperability (across platform features, drawing upon application programming interfaces or APIs). Platforms are not flat surfaces, as the name might suggest. They are more like 'pocket' universes, enabling complex economies. They are a space where internal modules connect to external ones or even to other platforms. They can be nested and built upon one another (ibid.). Second, platforms are intermediaries. They host dwellers, modules, and their interactions, and set rules for what happens inside them (ibid.). They have their own 'physics', defining how interactions can be pursued. They establish governance forms, and structure and (e)valuate internal artefacts and processes (ibid.). Third, they collect fine-grained data on the activities going on inside it (a process we can call datafication). They become able to capitalise on this, such as by improving platform functionalities, or by trading data in data markets (a process that has been labelled assetisation). The platform thus autonomously assures its own sustainability and is itself a kind of new organisational form (ibid.).

Platforms are thus far from 'neutral digital tools' (ibid., p. 2). They embody intermediary economic roles, like those of book publishers, insurance brokers, or record distributors. They exert comprehensive control over internal processes and relationships. They impose certain 'contracts' because the platform's software rules reign supreme. Codes that rule in-platform behaviour are the core, and by design are not negotiable, explaining how platforms influence users' decision-making processes and cognition (Decuypere et al., 2021). For an analogy, the small symbolic reward systems in platforms like Facebook or LinkedIn, such as 'like' buttons, interconnect with user crowds and their similar assessment mechanisms. These nudges shape dweller behaviours, inside and outside of the respective platforms' 'pocket universe'. Such institutional settings work

like city architecture, dress codes and other rules in the offline, physical world (Grimaldi & Ball, 2021).

Processes like these can drive differing, competing forms and logics of HE. They are heavily shaped by their EdTech provider firm's criteria, internally embedded in their architecture, defining which values seem legitimate (Decuypere et al., 2021). Besides the ability to capitalise on data platform providers extract from in-platform interactions (datafication, assetisation), they can shape these interactions via their platform. This could impact conceptions of appropriate learning processes and student–student interactions, for instance (Grimaldi & Ball, 2021; Williamson, 2021). Platform providers may not supply or own platform content; universities may supply it. Nevertheless, providers configure their platform processes for how platform 'life' occurs. They thus draw upon significant new power asymmetries (Komljenovic, 2021) by enacting governance as both infrastructure-providers and rule-shapers. A key dynamic for digital transformation of HE platform providers is that conceptions and expectations of what classrooms and campuses, may be displaced by how they are framed by platform providers. Connectivity is usually the term used to express how platforms connect people. If such connectivity is always mediated by in-platform rules, it is steered by how platforms conceive it. This can embody and be constrained by the provider's software 'business rules' (Martínez Guillem & Briziarelli, 2020).

Sub-Theme 1.1: Datafication or from Interactions to Data

Datafication is a conversion of human interactions into machine-readable formats or 'data'. Customer relationship management (CRM) systems are good examples of this process. They extract data from people's interactions in platform ecosystems to feed algorithms. These then create consumer profiles and offer matched products to consumers based on these profiles. The same logic underpins credit-scoring systems and the outlier example of China's—arguably dystopian—social credit platform to rank citizen behaviours (Liang et al., 2018). Datafication is seen as essential for dataveillance, both underpinning and enabling surveillance capitalism (Marachi & Quill, 2020). Here, value is created by data-scraping agents that colonise internal or external platform systems to monitor, profile and even predict customer behaviours. This is all with the

aim of using such data to inform and optimise a firm's market strategies and competitive power.

For human interactions on EdTech platforms in HE, market-oriented datafication aims to compress interactions into market-relevant data packages. This converts a 'mess' of human relationships into standardised, actionable data. This can involve standardisation via the use of algorithms. These may apply race, gender or other biases from patterns consciously or unconsciously introduced in the way algorithms work. For instance, Gilliard (2018) shows this for the Uber taxi platform. Uber's algorithm mediates between customer passengers and drivers to shield any apparent racist traits in selections and preferences. Such algorithms can allow users to 'feel innocent' whilst behind-the-scenes the platform continues to operate in questionable or discriminatory ways (Garcia, 2016).

In HE, datafication by EdTech platforms has led to a process of 'enumeration of the university' (Grimaldi & Ball, 2021; Williamson, 2019, p. 1; Williamson et al., 2020). Here platforms have '[d]ata mining capabilities' that gather 'data about student performance, analyze it, and use it to provide individualized feedback' (Mazoué, 2012). This feedback can be translated into scores for things such as 'student performance, sentiment, engagement, and satisfaction', and to provide 'proxy measures of the performance of staff, courses, schools and institutions as a whole' (Williamson et al., 2020, p. 354). This echoes a wider (e)valuative logic of the broader metric society (Lamont, 2012; Mau, 2019; Williamson, 2019; Zeide, 2017). Datafication can also be where EdTech 'solutions' (HolonIQ, 2021b) connect to other non-EdTech, but still data-rich platforms. Such cross-platform data flows can be hard to regulate (Marachi & Quill, 2020).

As more tools become available in EdTech platforms, and across connected platforms-of-platforms, the scale of data generated—and evaluative possibilities—can expand. Scholars have argued that expanding datafication ultimately leads to the transformation of students into perfect neoliberal subjects who pursue learning processes with outputs that are seamlessly yet comprehensively metrified (Biesta, 2018; Grimaldi & Ball, 2021; these ideas also link later to short-circuiting).

By aiming to make every interaction machine-readable, datafication relates to other HE transformational processes that reduce educational provision into actionable units, as we discuss later in this chapter (i.e., modularisation, crowdification, peer-to-peering, unbundling and skillisation). Datafication also enables and is sustained by assetisation of data by EdTech platform providers.

Sub-Theme 1.2: Assetisation or from Commodity to Asset

Assetisation, as Komljenovic (2020) cogently argues, indicates the increasingly 'rentier' nature of HE platform providers. The latter transform data from a commodity into an economic asset. Assets are legal constructs and are usable in a proprietary way by their owner. Assets have different supply and demand logics from commodities. As an asset's value increases, so does the demand for it, as its consumption does not imply its depletion. This can leave no incentive for further competitors to enter such a market (Komljenovic, 2020; Savona, 2019). Digital platform businesses, regardless of what they charge users for their products and services, rely on assetisation for profit-making. They capitalise on big data collected from a massive set of user interactions taking place inside their EdTech platform systems. They aggregate collected digital traces or 'data rents' effectively paid by platform users. For HE EdTech, students and faculty knowingly or unknowingly feed data about themselves into platform machine learning algorithms. These then shape pedagogical norms in educational tools and build EdTech platforms' market value. Provider firms can also repackage and sell this data to brokers in data marketplaces. This will be done according to the terms and conditions users accept when agreeing to use platforms, irrespective of whether they understand they are paying 'data rent' by so doing (Birch, 2020; Komljenovic, 2020). Data can feed and shape algorithms used by EdTech firms to offer products or services tailored to consumer profiles. Repackaged learner data can also be sold to industries that recruit from universities.

We know that individual privacy rights can be threatened by datafication (Benjamin, 2019; Crawford & Schultz, 2014). This has only just begun to be explored for data assetisation. Transparency here can be costly. Data may flow in ways that are hard to regulate or trace (Lynch, 2017). Use of deep neural networks within assetisation can by its very nature be not inspectable and thus inherently opaque. It

involves complex, multi-stage decisions hard to scrutinise with human oversight (Lynch, 2017). EdTech platform users may also be unable to meaningfully opt-out. For social network platforms, opt-out may be possible (Benjamin, 2019; Mau, 2019). Opting out of EdTech may restrict learning and career possibilities (Lynch, 2017). Similarly, apparent protections like the European Union General Data Protection Regulation (GDPR) can mitigate data rent risks (Komljenovic, 2020). However, the use of such standard protections can make users less likely to scrutinise fine details of the capitalisation of their data rent, because they assume it is protected by the regulation. A further complication is that assetisation can also occur at an aggregate group level, and yet still enable the identification of traits of unique individuals who may assume they are protected (Lynch, 2017).

Sub-Theme 1.3: Modularisation or from Continuum to Fragmentation

Modularisation, like unbundling (discussed later in this chapter), is connected to the segmentation of HE degrees or courses into smaller units of educational provision (HolonIQ, 2020b; Martínez Guillem & Briziarelli, 2020; Ovetz, 2020). From the platformisation meta-theme perspective, modularisation relates to how such segmentation affects the organisation of labour and education provision, and to how digital technologies mediate these changes. We see a move away from the role of the academic as a well-rounded professional that delivers education as a holistic experience, and towards a proliferation of discrete tasks and roles to do with, for instance, 'course design', 'course delivery', 'course evaluation', and so on. This also enables the employment of temporary and cheaper labour to perform some of these tasks (Stewart, 2010; Taylor, 1997). In HE this has been seen in the separation of research and teaching positions, and of content design from actual instruction (see also 'occupational disintermediation' in Mazoué, 2012, p. 21).

Modularisation is not new and predates platformisation, but the latter can support and accelerate the former. Similar to public service delivery systems, transaction costs for modularisation in HE are lower for digitalised technical processes (Schuppan, 2009). In a physical environment, some process energy is dissipated between actors. A digital environment instead allows seamless, optimised interactions. Platforms take this to a new level. Networks are denser, and more chain links can be datafied. At

one level, EdTech providers here can be thought as 'neoliberal "disruptors"'; they advocate fragmentation of HE in order to 'break up, disperse, automate, privatize, outsource, and off-shore the components of the HE value chain' (Ovetz, 2020, p. 3). Effects can be multi-directional, with platformisation powering modularisation, even as modularisation generates more interactions between newly disconnected modules that can then become datafied.

Sub-Theme 1.4: Crowdification or from Class to Crowd

Crowdification (our label) involve processes exemplified by MOOCs, particularly in their free-to-access versions, offered on platforms such as edX or FutureLearn, where EdTech providers partner with universities (Ruipérez-Valiente et al., 2020). These courses need certain technological infrastructure to support massive or 'crowd' scale attendance. Hypothetically, once launched they need only marginal costs to run again repeatedly, or to update content. Successful MOOCs seemingly target 'consumer-learners' who make 'rational choices' based on the reputation of universities as brands. MOOCs are taken in larger numbers if they involve high-level universities or 'star' lecturers (Shanley et al., 2020). These courses often do not generate profit for universities or platform providers. However, some revenue can be derived from 'freemium' schemes added to them, like selling completion certificates for small fees, or from outsourcing or reusing their content, and by assetising student data (Belleflamme & Jacqmin, 2016; HolonIQ, 2020a; Langseth et al., 2019).

MOOCs have been critiqued for not using 'connective' pedagogics and thus for not fostering interactive learning communities. They instead service 'crowds'. Some do afford space for critical thinking (Mazoué, 2012; Shanley et al., 2020) and enable interaction between learners, and with course content. However, such courses are still typically constrained by platform architecture, and so utilise potentially lower quality pedagogy like automatic quizzes, tests, games, or lightly curated forums. Such constraints are often necessary for MOOCs to be affordable to run or to take at scale, and these in-platform interactions may be datafied and assetised regardless of their quality (Lynch, 2017). Separate from MOOCs, other EdTech platforms that aim to massify learning can become 'crowdifying', so long as there is datafication sustaining it. Another aspect of 'crowdification' is that it does not necessarily imply inclusiveness.

However, this may be a discourse used to justify it, even by high-level politicians such as former US President Barack Obama who has championed platforms aimed at mass education (Mirrlees & Alvi, 2019). Crowdified online HE may not end up being better quality or higher reach than traditional HE. However, mass credentialling allied to crowdification does imply scaling up of data renting and datafication (Lynch, 2017).

Sub-Theme 1.5: Peer-To-Peering or from University to Web

Peer-to-peering (our label) relates to transformative possibilities of information technologies such as peer-to-peer (P2P) networks and decentralised transaction online registries or 'blockchains' (e.g., for course credentials). These are claimed to challenge traditional HE course provision (HolonIQ, 2020a). P2P necessarily relies on platforms, so user interactions are again ultimately shaped by providers. EdTech HE platforms such as Canvas or Moodle largely replicate in digital form a traditional teacher-class-student model. True peer-to-peering instead involves shifting teaching roles where anybody can learn anything from anyone, not only from a formally appointed instructor. The Skillshare platform promotes a model where users teach skills to each other (Pierce, 2021). However, Skillshare does not confer traditional credentials. These typically need to be granted by a formal, authoritative actor, like a university. Using blockchain infrastructure can promise to decentralise such certification away from traditional authorities, meaning users could, for instance, fill 'learner-wallets' instead of receiving diplomas from universities. Certain industry commentators indeed view such approaches as potentially more secure and relevant for learners. Courses in this domain often address industry-relevant skills. Here, decentralised credentialing could be more robust than perhaps more forgeable physical university certificates (HolonIQ, 2020a; Sanchez, 2020; Williamson et al., 2020).

Together, crowdification and peer-to-peering could weaken the institution of academia. Peer-to-peering does not rely upon a coherent and well structured common learning space in the same way as a university campus does. It could thus radically transform the organisational dynamics of HE course delivery, and not necessarily for the better. In highly regulated HE contexts such as the Nordics, these kinds of radical 'disruptions' are unlikely to gain much traction in the short term. Yet, the ideological power of peer-to-peering as a critique of the

academic lecturer's traditional authority in the classroom is widely felt, for instance through increasing emphasis on rhetorical devices in pedagogical discussions such as 'the teacher as learner' and 'students teaching each other'. Here too EdTech platforms play an important role in supporting these trends, as is the case with the flipped classroom, where the traditional lecture is substituted by active participation by students who have already engaged with the teaching materials delivered online before the class (Liu, 2019).

Meta-Theme 2: Learnification or from Student to Consumer-Learner

Our second meta-theme is what Biesta (2018) calls learnification. The core idea is that in the current 'learning age', how learning is understood has transformed from something that exclusively takes place in educational institutions, and at particular life or career stages, to something that can be found across all aspects and phases of human life. This is often encapsulated in the idea of the ever-improving 'lifelong learner'.

Learnification implies a shift of focus from the sites and agents of teaching, to learners and their learning. This is seen in HE now being more typically referred to as 'teaching and learning', rather than as simply 'teaching'. Students are called 'learners', teachers are 'learning facilitators', and universities are 'learning environments'. Here, the meaning of 'learning' has also changed. It has become somewhat individualistic, with each individual expected to yearn to learn and to have capacity to self-learn. Responsibility for learning has been passed from the lecturer and teacher instructors onto the learner (ibid.). This shift has a political component. Learning produces human capital, and lifelong learning is seemingly 'a key strategy to adjust human capital to new requirements' of the global economy (ibid., p. 248). At the same time, learning is individualised and potentially atomised—at least when contrasted with a more campus-based, community experience. Learning that matches competencies required for a specific job may also be fleeting, rather than enriching for an individual. Whether sufficient employment is available can also here be understood from being a problem of the state and the economy, to a belief that learners are at fault by being unable or unwilling to learn appropriate skills to match their labour market needs. Education here ceases to be a right, and becomes instead an internalised duty to learn (Biesta, 2018).

Labelling students as 'learners' is itself a transformation. It is a claim that a student lacks something, is not yet complete or competent, and needs further 'learning activity' (ibid., p. 251). This implied incompleteness links the dynamics of learning via EdTech HE platforms to consumerism. Learning itself becomes part of an imperative to consume. Lifelong consumer-learners must not only constantly better themselves, Tthey must also become individually responsible for making the right decisions about what they should learn next (see Siemens, 2005). This remains so even when forecasting job market needs can be impossible (Harari, 2019). Similarly, if learning experiences become routine and standardised—as they may be if EdTech platform HE courses are to be affordable and sustainable—this kind of learning may lose meaningfulness (Jarvis, 2018; Usher, 2018).

Sub-Theme 2.1: Unbundling or from Programmes to Courses

Unbundling is related to modularisation, but is more focused on the learners' dimension of breaking down traditional HE study prorammes into component courses or other smaller units. Unbundling is framed as a key aspect of the potential de-institutionalisation of HE, linked to ongoing learnification. The traditional nature of HE as a social institution becomes downgraded by fragmentation. This can lead to re-institutionalisation into new, not necessarily superior arrangements (Biesta, 2018; Komljenovic, 2020). Such fragmentation allows different stakeholders, not only faculty academics, to deliver courses. It enables 'consumer-tailored' HE 'experiences' that are segmented according to available study time, resources and locations of consumer-learners (Belleflamme & Jacqmin, 2016). Unbundling may be touted as alleviating education inequalities, by splitting perhaps expensive, on-campus long programmes into cheaper, shorter, self-contained, sometimes vocation-oriented online units (HolonIQ, 2020a; Mirrlees & Alvi, 2019).

Unbundling does not depend upon platformisation but can be strengthened by it. Platforms promise lower transaction costs for instructors and administrators, i.e., digital content units can be easily reused or repurposed (HolonIQ, 2020b). Where such materials become available beyond the local scope of lecturer delivery, this may crowd out the need or possibility for other lecturers to make or teach such materials. This can undermine faculty creativity, and contribute to 'deskilling, disqualifying' and 'demotivating the workforce' in universities (Martínez

Guillem & Briziarelli, 2020, p. 359; see also Ivancheva & Garvey, 2022). Unbundling also helps datafication. This is because the more learning units that exist to be interacted with on a platform, the more data there is to extract.

Sub-Theme 2.2: Skillisation and Short-Circuiting or from Education to Skills and Tasks

Skillisation and short-circuiting (our labels) reflect the interconnected nature of many of these transformation dynamics already reviewed above, and the ongoing 'blurring [of] boundaries between education and exploitation, learning and labour, students and workers' (Mirrlees & Alvi, 2019, p. 10). Skillisation is the shift from being educated to acquiring or learning 'skills' (HolonIQ, 2020a) that are then credentialed in separate packages via unbundling processes (Mazoué, 2012). Learning—in its profoundest sense of critical thinking, exploration, and growing self-awareness—is replaced by instrumental task completion, with tasks predominantly defined by ephemeral requirements of current labour markets and industry sectors (Ovetz, 2020; Zeide, 2017).

The EdTech company Pearson (Pearson, 2021; Williamson, 2021) exemplifies a platform firm aiming to invest in skillisation. Here, EdTech platforms with sufficient frameworks and tools to (e)valuate student skills connect these to labour market aspects (Deegan & Martin, 2018; Williamson, 2021). For instance, Pearson's interactive EdTech tool allows learner-users to 'predict' what skills they need to acquire, to improve their prospects of being employed in the projected labour market of 2030 (Williamson, 2021, p. 58). Skillisation thus involves not only fragmenting traditional HE 'knowledge packages' into instrumental units but also shaping learner behaviour. Similarly, EdSurge Research's guide to 'Defining Success Beyond Traditional Academics' encouraged learners to venture 'beyond traditional academic measures' and instead 'to focus on skills, habits, competencies and personality traits that will enable students to thrive in their future lives' (Nattoo, 2017, p. 2).

Datafication can thus be used for what we call short-circuiting: in electrical systems, short-circuiting occurs when electricity finds shorter pathways with less or no resistance; short-circuiting also leads to system malfunction. In the same way, EdTech platforms try to use data and algorithms to 'short-circuit' traditional paths of moving 'from learning to earning', and from 'major to wages' (Williamson et al., 2020, p. 355). The aim is to make things easier for students, but in the process, these new datafied, quicker pathways also tend to undermine the legitimacy and viability of traditional higher education provision: why spend years and years in higher education, when you can find the 'right' job for you much more quickly and with shorter training programmes? One example is EdTech firm Instructure (primarily known as the provider of the Canvas LMS) acquiring Portfolium (Hill, 2019), an integrated student portfolio certifier and course-evaluation system. Together these two platforms connect student skill information to employers through a platform currently in development called, Canvas TalentMatch (see Instructure Community, 2021). Other examples are Knack, which matches detected skills to employer demands, whilst a user plays games (Canner et al., 2015; Deegan & Martin, 2018; Williamson, 2019, 2021). Short-circuiting then involves EdTech providers embedding 'backdoors', allowing employers to inform skill development or pre-approve skills, independent of university-based credentials or certification (Marachi & Quill, 2020).

Short-circuiting changes the notion of who has power over education, shifting this from universities to EdTech platform providers. Such continuous performance evaluation, and embedding of consumer-based logics, can transform HE students into learners that become 'ready to adopt new techniques for self-management and improvement', leaving little freedom for 'alternative imaginings of self, citizens and society' (Marachi & Quill, 2020, p. 429).

Discussion

Across these nine themes, we see profound, interrelated processes that necessitate further scholarly attention in critical studies of education and call for greater focus on the critical political economy of the relationships between the HE sector and EdTech providers.

From this review, we begin to understand how EdTech platforms and their provider firms may both exemplify and induce transformation dynamics capable of reshaping entire HE systems and traditions. These changes also connect to broader, more contextual political economy developments, spanning many sectors of society beyond HE. This includes how EdTech platform approaches mirror logics and discourses of neoliberal and technological instrumentalism (Shanley et al., 2020). These rationales can be embodied, often invisibly, in platform designs and operating parameters, which then go on to shape student ideologies, norms and expectations about university teaching and learning, both on-campus and in online spaces (Komljenovic, 2021; Mirrlees & Alvi, 2019). Simply by deciding where to deploy their capital, investors in the EdTech platform sector effectively select which models and configure which interconnected platform ecosystems guide this evolution. In so doing, they aim to align new developments in the HE sector more to the interests of capital than to those of citizens (Komljenovic, 2020).

How should universities respond to these pervasive, intense transformation dynamics related to EdTech platform providers? While opting out might not be realistic at this stage, how do we ensure that societal values, such as equity, diversity, inclusion and non-discrimination, inform the algorithms and assumptions that sustain these platforms (see Williamson et al., 2020)? Is, advocating a shift to open access and creative commons principles an option (see Langseth et al., 2019)? Is enough to require that datafication be made more transparent (see Freire, 2000; Hayes & Cheng, 2020)? Alternatively, is a flat-out rejection of digital ideals needed, as proposed by The Analogue University collective (2019)? Should universities profoundly question the legitimacy of neoliberal evaluation systems and datafication processes that enable them? Should they strongly critique current AI-based predictive systems that are often faulty in use and could have wide-ranging effects on teachers' and learners' agency and freedom (see Selwyn & Gašević, 2020)?

Here we recall that 'EdTech is not an island, but part and product of society', and that 'it is shaped by and shapes the capitalist mode

of production' (Mirrlees & Alvi, 2019, p. 14). It seems impractical to propose alternatives without fundamentally modifying current capitalism. Neither should we dismiss all EdTech as necessarily negative technology. Otherwise, we risk a different form of technologically deterministic interpretation of HE digitalisation.

Finally, there may be a higher order theme emerging from our review. All these developments may already indicate the development of, in effect, a new hybrid public–private university organisational form (Christensen & Lægreid, 2011). In other words, HE platformisation might not be the end of traditional universities, even though the closer links it seems to produce between HE institutional logics and market logics are likely to have significant drawbacks. Going forward, it is important that, even in the most marketised settings, an ethos of HE as a public good becomes embedded in such university-EdTech relationships. This could help safeguard traditional roles, as various digitally transformed models co-exist with other forms. Whatever the future of EdTech in HE may be, it is key that we maintain a critical yet sensitive stance to these developments.

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