The rise of education rentiers: digital platforms, digital data and rents

Janja Komljenovic

Lancaster University, Lancaster, UK

Lancaster University, Department of Educational Research, County South, Lancaster, LA1 4YD, UK; email: j.komljenovic@lancaster.ac.uk

The rise of education rentiers: digital platforms, digital data and rents

The education sector is fast digitalising all of its operations. A large part is driven by proprietary digital products and services developed and offered by for-profit companies that form the education technology industry. This article aims to introduce a theoretical focus of rentiership and assetization into the study of the political economy of education technology. It discusses five potential transformations that the education sector is undergoing as a consequence of digital rentiership. These transformation address new rentee and potential rentier roles of education institutions, nestedness of digital platforms and their terms of use, a rise of contractual governance within the education sector, re-institutionalising the sector, and tensions between competition and monopoly in digital education markets. These trends are not exhaustive and represent only the start of the analysis on rentiership in education. The paper concludes with an invitation for future research.

Keywords: education market, digital platform, digital data, edtech, rentiership, asset.

Introduction

The global economy is changing and becoming increasingly digital. Business models explicitly focused on digital products and services are fast expanding, driven by the digital platform and the techno-legal-financial nexus of digital data extraction, enclosure, aggregation, analysis, and transformation into intelligence. Various authors encapsulate these changes with notions such as platform capitalism (Srnicek 2017), rentier capitalism (Christophers 2020), digital capitalism (Sadowski 2020b) and assetization (Birch and Muniesa 2020a). These authors highlight and analyse new forms of value construction in the economy, which do not lie in the production and exchange of commodities. Instead, we witness shifts from commodification to assetization, from entrepreneurship to rentiership and from buyer-seller to rentee-rentier relations.

The education sector is part of these broader shifts. As education institutions increasingly digitalise their operations, and learners pursue digital forms of education, there is a growing opportunity for established technology companies and start-ups to enter and expand in the education sector. Indeed, the education technology (edtech) industry is fast growing. It is currently valued at $187bn with the expected growth of 15 per cent and a value of $370-$410bn by 2025 (IBIS Capital 2020). The edtech industry employs business models aligned with the digital economy and brings assetization and digital rentiership in the education sector. There is excellent emerging critical research on the edtech industry, digital platforms and for-profit interests of their owners, and enclosure of digital data (see: Yu and Couldry 2020; Castañeda and Selwyn 2018; Selwyn et al. 2020; Player-Koro, Bergviken Rensfeldt, and Selwyn 2018; Mirrlees and Alvi 2019a; Wright and Peters 2017; Williamson 2019). However, the literature is largely missing theoretical and empirical attention to new ways of value construction in the edtech industry deriving from digital rentiership. If this is left unstudied, we are leaving a critical gap in understanding the sector's contemporary digitalisation dynamics, especially since authors identified the existence of a platform logic specific to education (Perrotta et al. 2020).

This article is theoretical. It aims only to start the analysis of digital rentiership in education. Employing a theoretical lens of rentiership and assetization, it offers five possible implications for education, which require further in-depth, case to case analyses. The five implications that are identified are not exhaustive, and there are many more processes that need to be theoretically and empirically analysed. The article thus invites the edtech scholars for continuing with this work. I proceed as follows. First, I elaborate on the digital economy and digital rentiership. I then discuss the five trends

that digital rentiership seems to be evoking in the education sector. I conclude with an invitation for further research.

Rentiership in the digital economy

Digital economy

The global economy is increasingly digital. More or less all economic, social and cultural sectors around the world are by now subject to *digitisation* and *digitalisation*, which refer to the conversion of data from the analogue to the digital form and its application in social and economic processes. However, the *digital economy* more specifically can be defined as "that part of economic output derived solely or primarily from digital technologies with a business model based on digital goods or services" (Bukht & Heeks, 2017, p.13). The changes in the structure of the global economy are substantial. Looking at the world's top 20 companies by market capitalisation and by sector, the shifts from 2009 to 2018 are the following: 'technology and consumer services' grew from 16% to 56%;' financial services' grew from 18% to 27%, while 'oil and gas' shrunk from 36% to 7% (UNCTAD, 2019, p.18). The mutual growth of technology and finance sectors is indicative of the rise of rentiership in the economy more broadly (Mazzucato 2018) and in the digital economy more specifically (Sadowski 2020b). Instead of entrepreneurial strategies based on commodity production, there is a focus on financial strategies of turning things into assets in the contemporary economy (Birch and Muniesa 2020b).

The edtech industry's growth is a good proxy to measure the expansion of the education sector's digital economy. The edtech market is currently valued at $187bn with the expected growth rate "between 14.5% - 16.4% per annum to a total value of $370-$410bn in 2025" (IBIS Capital 2020). In terms of venture capital (VC), the

"global EdTech started the last decade with $500m of Venture Capital invested in 2010 and finished 32x higher at $16.1B in 2020" and the VC investment is growing exponentially[1]. In the past few years, there is an increase in the size of specific investments due to edtech companies moving to series B of investment (Brighteye Ventures 2020). Private equity investment in edtech is growing too, and the industry saw its first special purpose acquisition company (SPAC) in 2020 (Brighteye Ventures 2021). Moreover, there is an emergence and growth of unicorns in edtech, i.e. the companies valued at over $1bn[2]. This is an impressive dynamic, indicating capital's increasing focus on education technology.

Digital platform

The business model in the digital economy is built on the digital platform (Srnicek 2017). Such a model has only strengthened its presence since the global financial crisis of 2008 as tech giants and new platforms gained dominant levels of power and wealth (Sadowski 2020a). The digital platform is a socio-technical intermediary creating multi-sided markets and coordinating network effects. It is also a business arrangement feeding the broader process of capitalisation (Langley and Leyshon 2017). The platform is thus an intermediary between users, and at the same time, the ground on which all the user activity happens, allowing the platform to record everything happening on it. The

---

[1] These figures are provided by Holon IQ, an international edtech market intelligence company: https://www.holoniq.com/notes/16.1b-of-global-edtech-venture-capital-in-2020/ (last access 14.1.2021).

[2] As of 14 January 2021, HolonIQ identified 19 edtech unicorns in the world: https://www.holoniq.com/edtech-unicorns/ (last access 14.1.2021).

platform is programmable, enabling software developers to go beyond the original designers' project (Plantin et al. 2018).

As the platform intermediates between users for different purposes and functions, we can talk about platforms in the plural, which led authors to develop various classifications. Some authors focus on interactions and circulations of the Web 2.0 in their understandings of platforms. For example, Langley and Leyshon (2017) categorise platforms in five types based on the domain of circulation: online exchange markets, social media and user-generated content, sharing economy, crowdsourcing, crowdfunding and P2P lending; while Christophers (2020) classifies them based on the trade they intermediate, i.e. labour, capital, commodity and attention platforms. Other authors understand platforms more broadly and also include service platforms with monetised business models, such as subscription. For example, Srnicek (2017) categorises them in five types based on their function and income generation: advertising, cloud, industrial, product, and lean platforms. A different take is from a technical, software perspective. In programming terms, platforms can be categorised based on how open or closed they are to external developers for modification. Andreessen sorts them in three groups that he calls access API, plug-in API, and runtime environment (Andreessen 2007). By bringing together technical, business and control dimensions of platforms, emerging mappings visualise and clarify the platform ecology that allows the interaction of various platforms (for example, see Hein et al. 2020).

Common to each case of the above platform classifications is that the platform owner controls the platform, including the rights of access, conditions of operation, and extraction of data. Consequently, scholars increasingly conceptualise digital platform owners as rentiers. Sadowski argues that "landlords and platforms both possess similar

positions of mediation, powers of access, purposes of extraction" (Sadowski 2020a, p.565) and Christophers (2020) describes the digital platform as a rentier literally and economically. Literally, it hires a platform out for third parties to conduct business with one another and charges for the use of this platform, which is a rental charge. Economically, the fees it receives for access or membership are induced by the asset that it owns and operates. The collected fees are rent, defined as the income or value derived from the ownership and control of a particular asset and its inherent or constructed scarcity, quality or productivity, under conditions of limited or no competition (Birch 2020; Christophers 2019). In the case of digital platforms, the rents come in the form of transaction fees, subscription or similar flat fees, fees per click, fees per view, and so on, depending on the type of intermediation that the platform performs (Srnicek 2017).

In education, we find very diverse digital platforms (Author, 2020). Following the above classifications, we can notice that education institutions engage with numerous types of platforms, but the analytical focus would be different in each case since authors categorise platforms based on different criteria. Overall, education institutions take different roles. They might act as rentees and pay the platform owner some sort of licence fee. They might act as partners by forming a partnership with a platform provider to deliver a digital service together and share profits. They could potentially take the role of rentiers if they licenced out assets that they have created alone. What allows the platform owner to collect rent is that the platform has an asset form. However, neither the asset nor the rent simply appears. Instead, rents are constructed as part of the process of assetization (Birch 2020).

Rentiership and assetization

Rentiership refers to the "appropriation of value through ownerships and control rights

(e.g., intellectual property [IP]), monopoly conditions, and regulatory or market devices and practices (e.g., investment dispute courts, exclusivity agreements)" (Birch 2020, p.3). Digital platforms are not inherently rentier, but are constructed by legal and financial regulation in the form of assets and secured via the pre-existing IP rights regime. While platforms and their parts such as algorithms or code, may be protected via copyright or by patents, digital data they extract is enclosed via copyright alone. Consequently, the software licence became a pivotal technology to manage relations between platforms and users (Sadowski 2020a).

Patents protect ideas and concepts, give 20-year exclusive monopoly rights over the invention in countries where they were registered, and prohibit independent development of inventions by other inventors. For example, Coursera had 32, and Pearson Education Inc. had 192 registered patents that could be found in the Espacenet database at the time of writing this article. Copyright is different in that it protects a particular form in which an idea is expressed. In the case of platforms, it is about the source and object code, and certain unique original elements of the user interface, but independent development of the copyrighted work is allowed. Copyright is automatic, there is no need to apply for it, there is no register, and the duration is up to 75 years from publication. Copyright means that the owner of a platform issues' terms of use', which is essentially a software licence agreement and acts as a contract between the owner and the users (Lemley 2006). It gives the owners exclusive rights, such as rights over access and exclusion, the right to copy software, create derivatives or modified versions, and distribute copies to the public by licence, sale, or otherwise. With software licence, there is thus enclosure of our everyday lives via digital data we leave by using platforms; while with patents, there is an enclosure of ideas and innovation.

Implications of digital rentiership in education

In the discussion thus far, I highlighted the broader issues concerning the digital economy of which edtech is part. They are consequential for the education sector and relevant to the researchers of education technology. In what follows, I discuss five implications of digital rentiership. These trends are intertwined and are separated only for analytical purposes. Moreover, this list is not exhaustive, and further research is needed.

Changing financial and value circuits

Monetary rents

Education institutions pay increasing amounts of monetary rents for access to digital products and services. A well-known example is universities' subscription to electronic publications (Muellerleile 2017). In the UK, the average subscription to academic journals among Russel Group universities was £4 million a year in 2018, while the cost rose 19 per cent in four years (Pells 2018). Overall, British universities spent over £1 billion on subscriptions to academic journals and other publishing charges in the past decade (Grove 2020). These charges are highly contested in the sector (Hotten 2020), and universities often cooperate and negotiate prices together, as well as there is a movement to open access from a moral perspective of access to knowledge by the public (Bacevic and Muellerleile 2017). However, the monopoly power of big publishers is clearly exercised. More than 90 per cent of said £1 billion was spent with five companies, out of which Elsevier is reaping the highest share – 41 per cent alone (Grove 2020). As conditions of monopoly dictate, the cost of rent depends on the negotiating power, and consequently, different universities pay substantially different fees for bundle subscriptions as analysed in the USA (Bergstrom et al. 2014).

This example illustrates a rentier's monopoly power and the ability to use the follow-through rights given to her by the legal system created around IP (Birch 2020). Academic publishers' case is also indicative of a move of previously existing platforms into a digital form. Publishers were platforms long before turning digital, in that they were intermediating between authors, reviewers, editors and readers. Before turning digital, "institutional journal subscriptions were sold journal-by-journal at the same subscription price to all academic libraries", while digitalising publications and intermediation services allowed publishers to adjust their pricing models and exercise their market power more effectively (Bergstrom et al. 2014, p.1). But the case of academic publishing is indicative also of a more profound change of such platforms into data and data intelligence businesses (Christophers 2020). Looking at Elsevier, it was founded in 1880 as a small publisher, and today it defines itself as an information analytics company, to which I turn later.

The example of academic publishing is only one out of numerous digital monetary rents that education institutions pay, such as site, the user or device licences, subscription licensing, datacentre licencing, and so on (Author, 2020). We do not know how much education institutions spend on digital rents as this is under-researched and under-reported[3]. However, there is a clear move from purchasing goods and services to paying for access or licence and thus paying different rents, which changes financial circuits within the sector. On the one hand, such a change in spending flows within the

---

[3] One available information provided by HolonIQ is that globally, out of all spending on education, 3 per cent is spent on digital services and products: https://www.holoniq.com/notes/global-education-technology-market-to-reach-404b-by-2025/ (last access 14 January 2021). This figure might include more than monetary rents.

sector turns education institutions into rentees who pay rents to rentiers and negotiate cost and condition of rent based on their market power. Digital platforms are new intermediaries between students, staff, education institution's managers, parents, potential students, recruitment agents, and other actors in the sector. They are new nodes in digital education value chains and active agents in extending these value chains. First, they extend the education markets. For example, by global intermediation, they allow offering courses to new students and new locations. Second, they extend the scope of education offer. For example, they allow intermediation for various education forms and provisions and not only traditional courses and programmes. Finally, they extend the diversity of actors in the digital ecology as well as points of value creation. All are centred around platforms as the intermediaries.

Data rents

Education institutions pay monetary rent for digital platforms' access and service, while students and staff as end-users pay what Sadowski (2020a) calls data rent and Langley and Leyshon (2017) call indirect rent. Data rent refers to the digital traces that students and staff leave behind when interacting with digital platforms. It includes content, such as posts and discussions in the virtual learning environment; and metadata, such as user location, data on user devices, time spent on particular sites, click-through, and so on. Both content and metadata can be understood as effectively personal data, which may be identifiable or non-identifiable. The premise in the digital economy is that such data is captured by platforms and made valuable. Data rentiership refers to the "pursuit of innovation strategies designed to capture or extract value through ownership and control of data as an asset" (Birch, Chiappetta, and Artyushina 2020, p.3). In the current legal arrangement, digital data has a dual quality of being a resource and a financial entity in the form of IP (ibid). But how is data assetised and made valuable?

It is by now clear that digital data markets were not established as anticipated in the earlier days of digitalisation, and besides the actual data brokering business, raw data is not bought and sold (Beauvisage and Mellet 2020). Indeed, most edtech companies explicitly state that they do not directly sell student or user data. However, there are many different ways for such data to be valorised rather than simply turning it into money (Sadowski 2019). It can be made valuable by processing data into intelligence for either improving an existing product or service, or creating a new one, selling data-based products (such as learning analytics or other data intelligence on students), various automated matching services, automated tailored advertising, exposure to the audience, and so on. The key here is that data is not rivalry in consumption, and can be used repeatedly in different operations and combinations (Savona 2019). Options are potentially limitless. Furthermore, the more data is collected, the better for platform owners. The premise in digital business models is to collect as much data as possible as soon as possible and find ways to monetise it later (Fourcade and Healy 2017). Such data expansive logic would imply that platforms will mediate more and more practices in schools and universities in the future. We already see examples of platforms beyond business management software and virtual learning environments, such as capturing and analysing emotions (McStay 2020).

Data becomes valuable when captured, processed and turned into intelligence, for which data ownership and control are key (Savona 2019). Pistor (2020) further argues that most of the data value is not derived from data use or exchange value, nor data ownership and control, but from their predictive power and inducing behaviour in others. Raw data is not rivalrous, but "the processed data and the algorithms that allow data controllers to extract predictive value from them, are rivalrous" (Pistor 2020, p.108). This would imply that what becomes valuable in digital education is power over

the direction of student and staff teaching, learning and work patterns. It is first about the power over calculating predictions and thus performing future, and second, about tailoring experience and nudging behaviour. Indeed, personalisation and tailored teaching and learning processes are seen as key platform services adjusted to the education sector's specificity (Perrotta et al. 2020). The key questions yet to analyse are how relations between education institutions and platforms are technically and legally arranged to capture, control and use the student and staff data, and which data.

To conclude, while public education is still substantially funded by the state, digital rentiership impacts financial circuits in the sector. The new monetary and data flows imply shifts from the state as a funder of public education, towards schools/universities and students/parents/staff as rentees who pay monetary and data fees. These are entirely new forms of privatisation of education that also move from production and commodities to assetization and rents.

Nestedness of platforms and policies

Proprietary platforms plug into education institutions' digital infrastructure (Williamson 2018) via application programming interfaces and allow data flow (Perrotta et al. 2020). The connection between proprietary platforms and education institution's digital infrastructure and the technical and legal framework of data flows can be understood at three levels. First is integrating external platforms into a school or a university digital infrastructure enabling full data flows. For example, if an education uses a Virtual Learning Environment (VLE) platform such as Blackboard, or a learning experience platform such as Aula Education, it connects it to its other internal databases such as staff and student directories. Other examples go beyond VLEs and would include the Microsoft ecosystem and Amazon Alexa for education. The relations between the institution and the platform are organised via the negotiated contract. While education

institutions must ensure that data privacy and other legal requirements are safeguarded, end-users become subject to their institution's rules as well as the platform's terms of use. Similarly, both the education institution and the platform's data privacy policies would apply for end-users, i.e. students and staff. In this case, the education institution would be the data controller of the extracted data by the platform, while the proprietary platform owner is the data processor. For example, Aula Education, the learning experience platform, states the following about the terms of use:

> You may use the service only if your institution has entered into a partnership with Aula Education, in which case your institution will have issued you with an official institution email address that you can use as a SSO to access and use the service. You must use the service in compliance with these Terms and all applicable local, state, national, and international laws, rules and regulations. (https://data.aula.education/Terms_of_Service.pdf, last access 14.1.2021).

And about the data control:

> If you are a student or tutor using the Aula platform provided to you through your university then we are a processor of your personal data processed on the Aula platform and your university is the controller. To find out how your personal data is used on the Aula platform please see your university's privacy policy or contact your university directly. (https://aula.education/privacy-policy.html, last access 14.1.2021)

The second level is the embeddedness of platforms, or what Nieborg and Helmond (2019) call 'nested platforms' where platforms exchange some data, but not all. This would be the case where an education institution embeds YouTube videos for viewing, Twitter widgets for tweeting about the website, Google analytics for tracking visitors to the websites, incorporating Facebook's like button, and so on. In such cases, these platforms collect and process data on traffic through the particular webpages, but not the other pages or platforms of the education institution, nor would they connect to the

institutional digital infrastructure. In such cases, the terms of use and privacy policies of external platforms fully apply, to which end users are directed when browsing through the institutional privacy policies.

This second level also includes various forms of limited connectedness between the institution's digital infrastructure and an external platform. They might be governed by different rules for students and staff as the end-users. For example, in partnership with universities, Coursera now offers various education provisions that include short courses, professional certificates, degrees and stackable courses. Students who take these degree courses would be subject to rules and regulation by a specific university offering a course, Coursera's terms of use, and a contract signed by their education institutions and the platform. Coursera is either a data controller or processor depending on the type of educational offering:

> Coursera, Inc. is the data controller of the personal information we collect about you (i.e., the entity that determines the means and purposes of collecting, using, and disclosing the personal information), unless you are part of a degree, certain MasterTrack programs, or certain enterprise programs, in which case Coursera is the data processor. (https://www.coursera.org/about/privacy, last access 14.1.2021)

Finally, the third level applies when an education institution uses external platforms entirely, such as social media, to communicate with various publics. For example, an education institution might create a profile on Facebook, a Facebook university or school page, and communicate with the public via Facebook Messenger. Even more, it might choose to itself programme (semi)open external platforms without connections to their institutional digital infrastructures, such as developing tailored tabs on its Facebook university or school page. In this example, as a hosting platform, Facebook collects data on all click-through and content of the university or school page and messages via the Messenger, but without any software connection to institutional digital

infrastructure (Nieborg and Helmond 2019). In this case, Facebook collects all the user data and is its controller and processor. End-users become subject to terms of use and data privacies of external, third-party platforms. The third level also applies in cases when platforms rented by education institutions allow plug-ins by third-party platforms. For example, Google Classroom allows integration with hundreds of applications, while 50 applications are directly advertised on the Google Classroom landing page (Perrotta et al. 2020). These three levels of nestedness (full integration, nestedness, and external development) each enable different technical and legal arrangements in terms of users' data flows.

Contractual governance of education

While the education sector is subject to public law, i.e. education legislation and regulation, digital platforms' expansion marks the parallel rise of contract law in the education sector. Contracts include those negotiated between platform owners and education institutions, as well as terms of use between platform providers and end-users. Terms of use have the legal status of contracts (Lemley 2006).

Education institutions take different rentee roles based on the three levels of platform nestedness discussed above. Institutions can either negotiate relations with platform providers to some extent and pay monetary rents in the form of subscription or flat service fees (Cohney et al. 2020). Or they become rentees subject to general terms of use unilaterally issued by the platform owner and pay data rent like in the case of Facebook, who then monetises data via advertising. Between these two extremes are various other possibilities, such as a joint education provision via an Online Programme Management (OPM) platform, where rentier and rentee relations become complex, and contracts determine the platform company-education institution relations.

The contracts that education institutions sign with platform providers determine service conditions, including control and processing of extracted data. Often they would be long term, such as in case of a service, i.e. joint education provision of a university with an OPM that would be signed for a substantial amount of time like eight years (Katzman and O'Brien 2017). This is a legal lock-in, which makes it impossible or costly to leave. Also, platforms often impose a technical lock-in as it might be legally possible to switch to a different platform, but would require substantial cost for migrating data and service configurations. Contracts between platform providers and education institutions are mostly classified as commercially sensitive. Thus, they are not publicly available to their end-users, researchers, or to the wider public. This implies a possible lack of public scrutiny. However, these contracts are essential to hold platforms to the account. Recently, Cohney et al found that "contracts negotiated with universities can lead to additional, significant differences in data handling from university to university, as well as from platform to platform" (Cohney et al. 2020, p.2). There is "significant variation in access to data and duration of data retention" (Cohney et al. 2020, p.10).

The nestedness of platform integration and nestedness of terms of use and privacy policies imply that students and staff become liable to their education institution's data policies and policies of proprietary platforms with which their institution has a contract. These contracts extend and not limit personal data collection and accumulation. As a result, students and staff as platform users end up with little control over how their personal data is used (Birch, Chiappetta, and Artyushina 2020), especially non-identifiable data. Since education institutions are integrating their digital infrastructures with more and more platforms, the questions where all the extracted data go, who encloses it, who controls it, who processes it and how it is used, become even

more pertinent. How does the integration and nestedness of platforms play out at the aggregated level of de-identified personal data, and at the level of metadata?

A platform's terms of use and privacy policies are based on user consent and are protected by relevant legislation, such as the General Data Protection Regulation (GDPR) in the European Union. However, when students sign up to a university course, or when someone is employed by an education institution, they have no choice but to use specific platforms made available by their education institution. The voluntary nature of their consent and control over data they produce, including de-identified metadata, is questionable. Such data is portrayed as naturally occurring in that students and staff leave it behind as they use technology for studying or working. In other words, the data is seen as if already present and even abundant, a surplus of learning or working process. This view is disputed by recognising that collected data is the outcome of numerous operations including intense labour that goes into data production (Selwyn 2020) as well as operations of data enclosure and valuation (Birch, Chiappetta, and Artyushina 2020).

Finally, another aspect of a shift to contractual governance of education is mergers and acquisitions (M&A), which are common strategies of digital platform companies (UNCTAD 2019). In such cases, data is transferred to a different entity than anticipated by the platform users, including personal data. For example, Coursera states:

> Coursera may disclose and/or transfer your Personal Data to an acquirer, assignee or other successor entity in connection with a sale, merger, or reorganisation of all or substantially all of the equity, business, or assets of Coursera to which your Personal Data relates. (https://www.coursera.org/about/privacy, last access 14.1.2021)

Examples from other sectors show that in cases of M&A, personal user data that was already collected before, might now be merged with other data newly acquired, and

both sets processed in ways not anticipated by users at the moment of data production. These new uses of data are determined by contracts between companies, while platform users have no control.

Digital platforms do not only intermediate, but make markets, determine the rules of the game on the platform, such as who can access it, what happens on it, how it happens, and so on (Christophers 2020). They inscribe what digital users can and cannot do, and hence impose on them a form of private governance unaccountable to the public (Teachout and Khan 2014). This might be seen as problematic in the light of platforms becoming an infrastructure similar to roads, railways, and electricity. To effectively function in today's society, one cannot avoid using them (Plantin et al. 2018). Therefore, platforms bring new power relations in the sector between themselves and education actors who are platform users; they also coordinate power relations between other education actors who are users of the platform. Such contractual governance of education shifts the weight of responsibility to educational institutions and further down to individuals and introduces new power asymmetries in their relations.

De- and re-institutionalising education

Edtech enables de-institutionalisation of education as a social institution, and its potential re-institutionalisation via alternate social structures, mechanisms, and forms of recognition. A few aspects of re-institutionalisation are unbundling of provision, managing education institutions by algorithms and analytics, and platforms targeting children, students, parents and staff directly.

Authors have identified unbundling as one of the main impacts of digital platforms in education (McCowan 2017). In the higher education setting, OPMs and Massive Open Online Courses (MOOC) enable unbundling of traditional university degrees, i.e. cutting content and provision into shorter pieces, and bringing them back

together either in the form of a new credential, a pathway to a credential or in a series of micro-credentials (Swinnerton et al. 2019). Unbundling of higher education might thus be seen as fragmentation of the holistic university experience resulting from the privatisation of data assets created from staff and students' data as platform users. Such unbundling results from new forms of asset management and its monetisation (Birch and Muniesa 2020a). Edtech investors and market commentators predict even a further proliferation of unbundling post-secondary education (Brighteye Ventures 2021).

Part of re-institutionalising education is an increasing reliance of education institutions on platforms for operations and management, such as automation of operation and data-driven decision-making aided by various analytics. Following the example above, Elsevier was founded in 1880 as a small publisher and today calls itself an information analytics company. It states the following:

> With the advent of digital technology the company started focusing on analytical and decision-making tools, helping with a wider range of high-value tasks and problems – moving beyond 'read this' and 'how to find this' to answer the customer's most pressing question: 'what should I do?' (Elsevier webpage: https://www.elsevier.com/about/history, last access 14.1.2021).

Since Elsevier runs its services via a digital platform, it is in a unique position to analyse the data it extracts and turn it into intelligence. Unlike platforms that act only as intermediaries, Elsevier also offers a variety of tangible services. As a platform owner, it makes and actively shapes markets in which it extends its value chains (Christophers 2020). As evident from the quote above, it employs the data that it controls as a platform owner, to its advantage to become a data company. It aims for not only projecting futures but materialising them with calculated solutions.

Finally, there seems to be a more substantial economic focus on individuals and corporations and less on schools or universities in edtech investment. The majority of

VC investment goes into platforms that target consumers/users directly or target corporations for staff development training. These two receive more than double investment compared to platforms targeting schools and universities (Brighteye Ventures 2020). The trend of investment into digital products and services targeting end users is even reinforced in the current pandemic (Koenig 2020; Brighteye Ventures 2021). Students, parents, and staff are willing to pay subscriptions or other fees to access digital services that they find useful for learning and work. This focus on individual users is supported by the rise in micro-credentials and alternative models of assessing skills, which might motivate learners to increasingly turn to these platforms for teaching and learning purposes rather than, or in parallel to, education institutions. In the case of lower education levels, this would probably lead to parents challenging schools more, as the focus of expertise shifts away from teachers to platforms and software (Yu and Couldry 2020). In the case of higher education, this might lead to the rise of alternative providers focusing on 'just in time' digital training opportunities, for which learners/users receive micro-credentials. This is the future imaginary portrayed by the industry actors[4]. It remains to be seen how this imaginary will play out. However, there are already initiatives to include micro-credentials and short e-learning courses into national qualification frameworks. In the case of Europe, micro-credentials are predicted to be included in the European qualification framework (Hanne Shapiro

---

4 For example, HolonIQ predicts that in 2021, "tuition inflation comes to an end as governments and consumers demand improved access, affordability and stronger ROI [return on investment]", by 2023, the "[i]ndustry credentials, alternative pathways to work and a progressively 'skills' focused economy drives substitutes and alternatives", and by 2025, the "[d]igital drives greater administrative productivity and efficiencies from a predominantly analogue foundation". (https://www.holoniq.com/notes/10-charts-for-a-changing-education-market/, last access 14.1.2021)

Futures, Andersen, and Larsen 2020). Such measures verify and legitimate alternatively acquired skills and put them on an equal footing as those who were achieved with education in schools and universities.

Collectively, these trends do not only mean unbundling of knowledge dissemination and support services but challenge the role of schools and especially universities as social institutions more broadly. An array of new social institutions are being set up that support a focus on the individual aided training via technology.

Changing conditions of competition, monopoly and innovation

This last section describes the theory and learnings from other sectors and aims to highlight considerations relevant to edtech. Securing property via IP may have adverse effects on innovation. The discourse prominent in and around edtech is that of disruption and competition (Ramiel 2020). However, the very logic of rentiership and the IP rights rests on the protection from competition, and in case of patents, even blocking the independent innovation. Rentiership is inherently monopolistic even though it needs market power to reach its asset potential (Christophers 2019). Despite a need for substantial investment, work and competition, especially at the beginning of a product or a company (Christophers 2019), the techno-legal-financial nexus of assetization via IP is ultimately privileging the ownership and control of financial claims on assets over their potential usefulness to users (Birch et al., 2020). The edtech scholars have analysed platforms, and their owners form a perspective of for-profit orientation in terms of competitiveness as in entrepreneurship and commodification. However, rentiership allows different impact and behaviour of asset owners, including staying in the control of assets and its derivatives. It is about who determines the future, how they do it and what it means for everyone else (Birch and Muniesa 2020a). It is necessary to empirically study how competition and monopoly are playing out in case

of edtech and the effects this might have on the education sector.

Finally, there is a lack of research on the edtech platforms regarding how they combine their various functions. Indeed, it is not uncommon that edtech vendors intermediate between students and education institutions and offer education services themselves at the same time. Williamson analyses the case of Pearson, the world's largest education provider. Its business model has moved entirely to the platform model, including a shift to renting (streaming) content instead of selling it, and offering the OPM solutions to universities at the same time (Williamson 2020). The functions of intermediation between users, a service for end-users (students and staff), and a service to education institutions (for example, a joint provision via an OPM) can become integrated into one vendor. This way, edtech platforms mediate between actors, structure markets and integrate services across business lines. In the case of commerce, Khan writes that such structure "places dominant platforms in direct competition with some of the businesses that depend on them, creating a conflict of interest that platforms can exploit to entrench their dominance further, thwart competition, and stifle innovation" (Khan 2019, p. 973). She argues that structural separations are necessary to maintain market competition. Empirical research is needed to understand how various integration of service and intermediation work in education and with what effect.

Conclusion

This article focused on the political economy of edtech. Others have analysed particular implications of digital platforms in education, such as robot pedagogy (Zeide 2019), datafication of teaching and education subjects (Williamson, Bayne, and Shay 2020), and increased surveillance of students and staff (Hope 2016). There is also emerging work on the intersection of technology and marketisation, including for-profit motives of tech companies (Castañeda and Selwyn 2018), their aims and imaginaries (Yu and

Couldry 2020), and market-making strategies of particular actors, such as Pearson (Williamson 2020). These are incredibly rich and relevant studies. This article contributes to the field by introducing a theoretical lens of digital rentiership and assetization. It includes attention to transformations of the global economy more generally, in which edtech is embedded.

Digital rentiership in education is analysed through five implications. First, education institutions increasingly pay monetary rent, while their students and staff pay data rent. Digital platforms extend value chains in education and establish new rentier-rentee relations in the sector. Second, platforms connect to education institutions' digital infrastructure in different techno-legal ways. Three levels are identified, namely, full integration, nestedness, and external development. Each case has a different arrangement of ownership and control. However, students and staff as end-users become liable to various terms of use and data policies that include their education institution's policies as well as external platforms'. Third, these terms of use together with negotiated contracts between platform companies and education institutions represent the expansion of contractual governance in education. It remains to be studied how useful and understandable the user consent is for end-users in practice. Fourth, unbundling the student experience, decision-making aided by algorithms and automated processes, and individual use of platforms bypassing education institutions might contribute to de-institutionalising education. However, new rules and forms of valuation and recognition are being set up, leading to re-institutionalising education. Finally, digital platforms' monopoly tendencies might have more considerable consequences for the sector once more platforms grow in size and power. There are already 19 companies valued at more than $1bn in the world, and based on market predictions, there will be

more. How this will impact the knowledge production, curation and dissemination as social processes, remains to be seen.

These five sets of processes are only the start of the study of digital rentiership in education. I invite edtech and other scholars to continue with this research, including detailed, case to case empirical analyses. Moreover, the identified processes do not represent an exhaustive list, and the fast-evolving edtech includes more key processes. As the currently ongoing Covid-19 pandemic is speeding up platformization of education, the political-economic questions on the value construction and power relations between platforms, education institutions, and students and staff as end-users become even more relevant.

Declaration of interest statement

No potential conflict of interest was reported by the author.

References

Author, 2020.

Andreessen, Mark. 2007. "The Three Kinds of Platforms You Meet on the Internet." *Wayback Machine*.

Bacevic, Jana, and Chris Muellerleile. 2017. "The Moral Economy of Open Access." *European Journal of Social Theory*. https://doi.org/10.1177/1368431017717368.

Beauvisage, Thomas, and Kevin Mellet. 2020. "Datassets: Assetizing and Marketising Personal Data." In *Assetization: Turning Things Into Assets in Technoscientific Capitalism*, edited by Kean Birch and Fabian Muniesa, 75–95. Cambridge, Massachusetts and London, England: MIT Press.

Bergstrom, Theodore C., Paul N. Courant, R. Preston McAfee, and Michael A. Williams. 2014. "Evaluating Big Deal Journal Bundles." *Proceedings of the National Academy of Sciences of the United States of America*, 1–6. https://doi.org/10.1073/pnas.1403006111.

Birch, Kean. 2020. "Technoscience Rent: Toward a Theory of Rentiership for Technoscientific Capitalism." *Science, Technology, & Human Values* 45 (1): 3–33.

Birch, Kean, Margaret Chiappetta, and Anna Artyushina. 2020. "The Problem of Innovation in Technoscientific Capitalism: Data Rentiership and the Policy Implications of Turning Personal Digital Data into a Private Asset." *Policy Studies*. https://doi.org/10.1080/01442872.2020.1748264.

Birch, Kean, and Fabian Muniesa, eds. 2020a. *Assetization: Turning Things into Assets in Technoscientific Capitalism*. Cambridge, Massachusetts and London, England: MIT Press.

———. , eds. 2020b. *Turning Things into Assets*. Cambridge, Massachusetts and London, England: MIT Press.

Brighteye Ventures. 2020. "The European EdTech Funding Report 2014-2019." https://drive.google.com/file/d/1I5qCkgtmA8E6Fjo9wloQ8cVdbBIXH42W/view.

———. 2021. "The European EdTech Funding Report 2021."

Bukht, Romana, and Richard Heeks. 2017. "Defining, Conceptualising and Measuring the Digital Economy." 68. *Development Informatics Working Paper Series*. Vol. 68. Manchester.

Castañeda, Linda, and Neil Selwyn. 2018. "More than Tools ? Making Sense of the Ongoing Digitisations of Higher Education." *International Journal of Educational Technology in Higher Education* 15 (22).

Christophers, Brett. 2019. "The Problem of Rent." *Critical Historical Studies* 6 (2): 303–23.

———. 2020. *Rentier Capitalism: Who Owns the Economy, and Who Pays for It?* London: Verso.

Cohney, Shaanan, Ross Teixeira, Anne Kohlbrenner, Arvind Narayanan, Mihir Kshirsagar, Yan Shvartzshnaider, and Madelyn Sanfilippo. 2020. "Virtual

Classrooms and Real Harms." https://arxiv.org/abs/2012.05867.

Fourcade, Marion, and Kieran Healy. 2017. "Seeing like a Market." *Socio-Economic Review-Economic Review* 15 (1): 9–29.

Grove, Jack. 2020. "UK Universities 'Paid Big Publishers £1 Billion' in Past Decade." *Times Higher Education*, March 12, 2020. https://www.timeshighereducation.com/news/uk-universities-paid-big-publishers-ps1billion-past-decade.

Hanne Shapiro Futures, Tine Andersen, and Kristine Nedergaard Larsen. 2020. "Executive Summary: A European Approach to Micro-Credentials." Luxembourg: European Commission. https://doi.org/10.2766/67.

Hein, Andreas, Maximilian Schreieck, Tobias Riasanow, David Soto Setzke, Manuel Wiesche, Markus Böhm, and Helmut Krcmar. 2020. "Digital Platform Ecosystems." *Electronic Markets* 30 (1): 87–98.

Hope, Andrew. 2016. "Biopower and School Surveillance Technologies 2.0." *British Journal of Sociology of Education* 37 (7): 885–904.

Hotten, Russell. 2020. "University Staff Urge Probe into E-Book Pricing 'Scandal.'" *BBC News*, November 14, 2020. https://www.bbc.co.uk/news/business-54922764.

IBIS Capital. 2020. "X Report." https://ecosystem.edtechxeurope.com/edtechx-2020-report?__hstc=213653323.221cd7b3393af4ece1042d2f5a5f50b3.1593002186886.1593002186886.1593002186886.1&__hssc=213653323.4.1593002186886&__hsfp=865949483.

Katzman, John, and Greg O'Brien. 2017. "Revenue-Share Agreements and OPMs: Seeking a Better Alternative." Noodle Partners. https://www.noodlepartners.com/wp-content/uploads/Revenue-Sharing-2_EGD.pdf.

Khan, Lina M. 2019. "The Separation of Platforms and Commerce." *Columbia Law Review* 119 (4): 973–1098.

Koenig, Rebecca. 2020. "The Post-Pandemic Outlook for Edtech." 2020. https://www.edsurge.com/news/2020-06-11-the-post-pandemic-outlook-for-edtech.

Langley, Paul, and Andrew Leyshon. 2017. "Platform Capitalism: The Intermediation

and Capitalisation of Digital Economic Circulation." *Finance and Society* 3 (1): 11–31.

Lemley, Mark A. 2006. "Terms of Use." *Minnesota Law Review* 91 (2): 459–83.

Mazzucato, Mariana. 2018. *The Value of Everything : Making and Taking in the Global Economy*. London: Allen Lane.

McCowan, Tristan. 2017. "Higher Education, Unbundling, and the End of the University as We Know It." *Oxford Review of Education* 43 (6): 744–48.

McStay, Andrew. 2020. "Emotional AI and EdTech: Serving the Public Good?" *Learning, Media and Technology* 45 (3): 270–83.

Mirrlees, Tanner, and Shahid Alvi. 2019. *EdTech Inc: Selling, Automating and Globalizing Higher Education in the Digital Age*. New York and London: Routledge.

Muellerleile, Chris. 2017. "Open Access Panacea: Scarcity, Abundance, and Enclosure in the New Economy of Academic Knowledge Production." In *Handbook of Political Economy of Science*, edited by David Tyfield, Rebecca Lave, and Charles Thorpe. London: Routledge.

Nieborg, David B., and Anne Helmond. 2019. "The Political Economy of Facebook's Platformization in the Mobile Ecosystem: Facebook Messenger as a Platform Instance." *Media, Culture and Society* 41 (2): 196–218.

Pells, Rachael. 2018. "Top Universities' Journal Subscriptions 'Average £4 Million.'" *Times Higher Education*, June 12, 2018. https://www.timeshighereducation.com/news/top-universities-journal-subscriptions-average-4-million-pounds.

Perrotta, Carlo, Kalervo N Gulson, Ben Williamson, and Kevin Witzenberger. 2020. "Automation, APIs and the Distributed Labour of Platform Pedagogies in Google Classroom." *Critical Studies in Education*. https://doi.org/10.1080/17508487.2020.1855597.

Pistor, Katharina. 2020. "Rule by Data: The End of Markets?" *Law and Contemporary Problems* 83 (2): 101–24.

Plantin, Jean Christophe, Carl Lagoze, Paul N. Edwards, and Christian Sandvig. 2018.

"Infrastructure Studies Meet Platform Studies in the Age of Google and Facebook." *New Media and Society* 20 (1): 293–310.

Player-Koro, Catarina, Annika Bergviken Rensfeldt, and Neil Selwyn. 2018. "Selling Tech to Teachers: Education Trade Shows as Policy Events." *Journal of Education Policy* 33 (5): 682–703.

Ramiel, Hemy. 2020. "Edtech Disruption Logic and Policy Work: The Case of an Israeli Edtech Unit." *Learning, Media and Technology*. https://doi.org/10.1080/17439884.2020.1737110.

Sadowski, Jathan. 2019. "When Data Is Capital: Datafication, Accumulation, and Extraction." *Big Data & Society* 6 (1): 1–12.

———. 2020a. "The Internet of Landlords: Digital Platforms and New Mechanisms of Rentier Capitalism." *Antipode* 52 (2): 562–80.

———. 2020b. *Too Smart: How Digital Capitalism Is Extracting Data, Controlling Our Lives, and Taking Over the World*. Cambridge, Massachusetts and London, England: The MIT Press.

Savona, Maria. 2019. "The Value of Data: Towards a Framework to Redistribute It." SWPS 2019-21. https://www.sussex.ac.uk/webteam/gateway/file.php?name=2019-21-swps-savona.pdf&site=25.

Selwyn, Neil. 2020. "The Human Labour of School Data: Exploring the Production of Digital Data in Schools." *Oxford Review of Education*. https://doi.org/10.1080/03054985.2020.1835628.

Selwyn, Neil, Thomas Hillman, Rebecca Eynon, Giselle Ferreira, Jeremy Knox, Felicitas Macgilchrist, and Juana M. Sancho-Gil. 2020. "What's next for Ed-Tech? Critical Hopes and Concerns for the 2020s." *Learning, Media and Technology* 45 (1): 1–6.

Srnicek, Nick. 2017. *Platform Capitalism*. Cambridge, England ; Malden, Massachusetts: Polity.

Swinnerton, B, T Coop, M Ivancheva, L Czerniewicz, N P Morris, R Swartz, S Walji, and A Cliff. 2019. "The Unbundled University: Researching Emerging Models in an Unequal Landscape." In *Mobility, Data and Learner Agency in Networked Learning. Networked Learning Conference Series*, edited by N Bonderup Dohn, P

Jandric, T Ryberg, and M de Laat. Springer.

Teachout, Zephyr, and Lina Khan. 2014. "Market Structure and Political Law: A Taxonomy of Power." *Duke Journal of Constitutional Law and Public Policy* 9 (1): 37–74.

UNCTAD. 2019. *Digital Economy Report: Value Creation and Capture—Implications for Developing Countries*. Geneva: United Nations Conference on Trade and Development.

Williamson, Ben. 2018. "The Hidden Architecture of Higher Education: Building a Big Data Infrastructure for the 'Smarter University.'" *International Journal of Educational Technology in Higher Education* 15 (12).

———. 2019. "Policy Networks, Performance Metrics and Platform Markets: Charting the Expanding Data Infrastructure of Higher Education." *British Journal of Educational Technology* 50 (6): 2794–2809.

———. 2020. "Making Markets through Digital Platforms: Pearson, Edu-Business, and the (e)Valuation of Higher Education." *Critical Studies in Education*. https://doi.org/10.1080/17508487.2020.1737556.

Williamson, Ben, Sian Bayne, and Suellen Shay. 2020. "The Datafication of Teaching in Higher Education: Critical Issues and Perspectives." *Teaching in Higher Education: Critical Perspectives* 25 (4): 351–65.

Wright, Noeline, and Michael Peters. 2017. "Sell, Sell, Sell or Learn, Learn, Learn? The EdTech Market in New Zealand's Education System–Privatisation by Stealth?" *Open Review of Educational Research* 4 (1): 164–76.

Yu, Jun, and Nick Couldry. 2020. "Education as a Domain of Natural Data Extraction: Analysing Corporate Discourse about Educational Tracking." *Information, Communication & Society*. https://doi.org/10.1080/1369118X.2020.1764604.

Zeide, Elana. 2019. "Robot Teaching, Pedagogy, and Policy." SSRN. https://ssrn.com/abstract=3441300.