



Working Paper Series

Platform Capitalism and the New Value Economy in the Academy
Susan L. Robertson, Faculty of Education, University of Cambridge
slr69@cam.ac.uk

R. Gorur, S. Sellar and G. Steiner Khamsi (eds.)
World Yearbook of Education 2019: Methodology in an Era of Big Data and Global Networks,
London and New York: Routledge

Introduction

The arrival of what is being called the ‘big data’ revolution in societies around the globe has presented social scientists with new challenges as to how best to understand it as a phenomenon, on the one hand, and what conceptual and methodological approaches we might use to research it, on the other (e.g. Burrows and Savage, 2017; Venturini et al., 2017). The focus of this World Yearbook on big data and comparative methodology is thus a timely opportunity to engage with, and begin to theorize these developments¹.

This is not to suggest the matter of data, the academy and comparison is an under researched area. Far from it! There is a growing body of published work on big data-driven global rankings of universities (cf. Hazelkorn, 2017). However much of this commentary is either a critique of quantification, with the argument that numbers are political (Porter, 1995), or to show how such comparisons generate anxiety about overall placements in ranking thus stimulating efforts to improve (see Epseland and Sauder, 2016 – engines of anxiety). Some of my own work has also addressed this issue, where I have shown that the comparison of large amounts of data-driven indicators generates national, regional and global competition through the vertical organization of numbers (‘competitive comparison’ - Robertson and Olds, 2017). These governing strategies are particularly effective because of their deployment of multiple modalities of power; ensuring the temporal horizon is always in view, the use of affect – such as pride and shame; and the frictionless movement of numbers through space and across scales.

However it is increasingly clear there is a great deal more to be problematized, explored and explained regarding the academy, data, and comparison, when we bring data infrastructures, like the platform, into view. This chapter is therefore a first cut at extending our descriptions and theorizations of data and platforms with a particular emphasis on what can be revealed through a critical approach to multiple modalities of comparing across time and the political economies of platforms.

The chapter is developed in the following way. First, I introduce the idea of ‘critical comparison’ drawing on the work of Steinmetz (2004) and Robertson and Dale (2016) – an approach anchored in a critical realist ontology which argues that we can compare at the level of explanation as to how mechanisms in context produce effects, or outcomes. Second, I introduce the platform as a new kind of organizational form which is currently black-boxed in such a way as to conceal the new and very different ways in which these organisations work, and how value is created. Third, I show the ubiquity of platforms in the higher education sector, and the ways in which they increasingly mediate a range of new forms of knowledge creation, their circulation, and consumption. I identify six knowledge production purposes and show how comparing enables us to trace: (i) shifts over time in different processes and forms of knowledge production, circulation and consumption; (ii)

¹ I will use the terms ‘the academy’, ‘higher education’ and the ‘higher education sector’ interchangeably in this paper, though I recognize the differences between them. The academy in this paper refers largely to ‘the idea of the university’ and its role in advanced knowledge creation, circulation and consumption. The academy, of course, is located in the higher education sector; the idea of ‘the sector’ refers to the ecology in which the academy is located and recognizes that it has become increasingly important as more and more activity is unbundled and outsourced to the private economic realm.

their political economies; (iii) forms of algorithmic governance; and (iv) means through which value is created and accounted for. I conclude by arguing such critical comparisons can reveal the complex and diverse ways in which digital platforms not only create new relational possibilities, and open up new worlds, but also make possible new identities, forms of expertise, and practices within the academy and the wider society.

Critical Comparison – Notes on Methodology

There are two main ways we can approach ‘comparison’. On the one hand, we can ask: in what contexts is it useful, to whom, and for what purposes? On the other, we can ask: what does it tell us about the relationships between the different contexts and outcomes, and what elements can be identified as important, and why?

The differences between these two sets of questions are crucial in understanding the contributions of comparison in addressing big data and higher education. In the first case, comparison can be used as a ‘resource’; that is, as a contribution to the achievement of particular ends. This form of comparison has become a favoured means of governing especially by modern governments as well as non-governmental agencies. Their main purpose is to use comparison to drive improvement (Novoa and Yariv-Mashal, 2003).

In the second case, comparison becomes the ‘means’ or the methodology for inquiring. In adopting this second approach we need to ask ourselves: what exactly are we comparing? This is an ontological and epistemological, as well as a methodological, question. By this I mean that in considering comparison as a methodology, we are also making decisions about how we think the social world works (ontology), and what might count as a means of knowing it (epistemology).

Does the social world operate according to a set of regularities, and are we able to bring those regularities into view and decide upon what causes what? Positivists would say yes. Or, do we argue that there is more to the social world than what we see, and that these less visible structures and conjunctions of possibilities shape what is possible to think, say, and do, and which therefore have effects. This latter, broadly critical realist, approach is the one I am drawing on here; it is based on an ontological assumption that realities are socially stratified, and that the causal mechanisms and powers shaping events are not necessarily likely to be visible to the researcher, though their contexts and outcomes are (Sayer, 2000). Working backwards to sort out the relationship between outcomes, mechanisms in context, and causal powers is an important procedure for a critical realist researcher.

Here Steinmetz’s (2004) work very helpful. He, argues that comparison often “...operates along two dimensions - events and structures, corresponding to one of the main lines of ontological stratification of the social- real” (2004: 372). While positivists tend to focus on ‘events’ and view social systems as fixed and closed, “...critical realists insist on the ontological difference between events and mechanisms and on the ubiquity of contingent, non-recurrent, conjunctural determination of events within open systems such as the social. This means that events that are incomparable at the phenomenal level still may be amenable to explanation in terms of a conjuncture of generative causal mechanisms” (Steinmetz, 2004: 372). In is in this

sense that comparisons can be made between our explanations of the underlying causal processes and mechanisms at work, and their emergent properties, and outcomes. A critical realist approach to comparing data and platforms in higher education would thus focus attention on the conjuncture between causal mechanisms at work in contexts and their outcomes, and it is our explanations of these processes and outcomes that sits at the heart of comparison.

Beyond Tropes: Making Platform Infrastructures Visible

The first step in making visible the diverse and complex ways data-driven platforms are remaking worlds is to problematize their black-boxing as they enter as new practices and trendy tropes. “Terms like sharing, gig economy and the fourth industrial revolution are tossed around, with enticing images of entrepreneurial spirit and flexibility bandied about” (Srnicek, 2017: 1). This has led critics to point to the danger of researchers confusing ideology with scientific paradigm (van Dijck, 2014), and fetishizing terms like algorithms, big data and platforms (Thomas et al, 2018). In doing so it is too easy to fail to ask questions like: What are platforms? And, what work do these words do to bring some social phenomena and relations into being, and others not. This is by no means a new insight. Yet it is notable how quickly we forget this when shiny new tropes vie for attention. Some tropes – like ‘knowledge economies, or in our case the platform’ are particularly powerful precisely because they are sufficiently vague and yet flexible to “...work across multiple venues for multiple audiences” (Gillespie, 2010: 349).

At its most basic, platforms are digital infrastructures which enable two or more groups to interact with each other. For example Uber – as a share riding company, brings together taxis with riders. Similarly Zopa – as a new lending organization different from a bank - brings together investors and lenders, while the platform owner is a third party who charges a percentage of the transaction for the use of the platform. Platforms are thus intermediaries as well as infrastructures, able to bring together large numbers of users - from customers to advertisers, service providers, producers, suppliers, and even physical objects (Srnicek, 2017: 43).

The platforms underlying intermediary logic is that it not only solves coordination problems in market exchanges, but they offer the possibility of multi-sided exchanges (not just buyer and seller) (Evans, 2003). For example, Microsoft coordinates a three-sided market that includes computer users, application developers, and hardware manufacturers. Their business model rests on their ability to ensure trust between the buyers and the sellers (Kornberger et al., 2017: 79).

Platform ownership is essentially ownership of software and hardware, built upon open-source material put to work to extract and control data (Srnicek, 2017: 48). A key advantage of the platform over more traditional forms of business is that the platform is also as the ground on which the activities of the users take place This gives platform owners privileged access to record this activity, or traces, and to use this as data, in turn generating new forms of value. Platforms also typically come with a series of tools that enable users to build their own products and services and marketplaces. In this sense platforms can be understood as a new organizational form (Kornberger et al., 2017) that .

A particular feature of platforms is that they produce and are reliant on 'network effects' (Srnicsek, 2017: 45). The more the number of users, the more valuable the platform for everyone else and the better the search algorithms become. The effect of users begetting more users leads to platforms having a tendency towards monopolization as they crowd out some of their competition. Platform owners also buy up competitors; they are also on the lookout for additional tools and functions to enable them to expand the nature of their intermediary activities. Platforms enable scaling up activity quite quickly, as they can rely on existing infrastructures. For instance Uber can quickly expand its business across a number of global cities as it does not need to own the taxis; it is merely the platform that manages the coordination. Scaling up is largely a coordination and data storage issue.

Yet platforms have been widely equated with the new sharing economy. This disjuncture between profits and sharing led German blogger, Sascha Lobo (2014) to coin the term platform capitalism. Platform businesses – such as peer-to-peer lender Prosper – valorize the idea of participation, connectedness and sharing in their marketing, so that the venture capitalist and the debtor are placed together in a relation of equals. This plays down their long-term motive; of generating profits, though it is not always clear in the early days of a platform how profits will be made.

A second step in making platform infrastructures visible and open to comparison is to ask about different kinds of platforms and how they work. Langley and Leyshon (2016) distinguish between different types, from online market exchanges to social media and user content, the sharing economy, crowdsourcing, and peer-to-peer lending. In doing so we can see different models of 'the firm' at work, along with their politics and possibilities.

My own (not exhaustive) approach to comparing platforms in the academy (see Table 1) is to describe particular purposes/processes of knowledge production – for example, 'curating knowledge', 'publishing knowledge', 'teaching and learning knowledge', 'professional profiles and employment', 'financing knowledge creation and distribution', and 'quality of teaching and research'. We can then also compare the nature of their political economies (e.g. who is the owner, degree of openness versus proprietary nature of the business; mergers and take-overs); the form of algorithmic governance (clicks, number of visits, likes, quizzes, and so on); and how worth and value is created (endorsements, reviews, likes) and accounted for (e.g. number of views, risk assessment). Making the infrastructure of the platform more visible in this way means being open to revising our understandings and explanations of how these new organizational forms work.

To this end, the pioneering work of Kornberger and colleagues (2017) on what they call evaluative infrastructures has been central to my thinking, and offers itself as a conceptual grammar on which to base comparison. They argue that platforms are different to networks, hierarchies, and classical understandings of markets (as two-sided). Drawing on a language broadly shared between actor network theory and economic sociology, Kornberger et al argue; "...infrastructures are assemblages of technical artifacts, institutional arrangements and cultural habits and social conventions" (2017: 85). As an assemblage, it is dynamic and evolving; for example, Elsevier's constantly evolving platform has transformed this giant publishing firm into one

specializing in information and research management. Platform infrastructures relate heterogeneous elements (people, language, numbers, cultures, practices, pipes, circuits) to each other in new ways. In this sense they are therefore profoundly relational (Kornberger et al., 2017: 85). Platforms are also generative (ibid); they not only connect pre-given landscapes, but also create new worlds (for example, new ways of curating knowledge – made possible by Wikipedia’s wiki tool). The platforms evaluative quality refers to the mechanisms and practices that generate orders of worth. This is premised on an understanding that value is not an objective property of a good, but the outcome of processes and practices of valuation (ibid). An evaluative infrastructure is thus taken to mean “...an ecology of devices that disclose values of actions, events and objects in heterarchically organized systems (such as the platform) through the maintenance of a protocol” (Kornberger et al., 2017: 85). By comparing the ecology of mechanisms (devices) in context (a platform at a particular moment in time/space/society), we establish the basis for comparison at the level of explanation and not at the level of events/experiences. This approach answers the question – how does it work to create those effects, as well as who did it work for, and why.

And what of higher education and platforms, our third step in making platform infrastructures visible?

Platforms have become ubiquitous in the academy to the point that many universities depend on a wide range of them – from initially recruiting students, to managing alumni, and sorting out sharing class activity.

Students, Faculty and Alumni routinely use Facebook and WhatsApp to message each other; Twitter feeds sit on institutional and individual webpages commanding serious amounts of time and demanding new kinds of institutional expertise; LinkedIn – a digital network of people sharing their professional profiles involves a very large number within the academy and is increasingly conceptualized as a form of human resource management; Wikipedia - a free encyclopedia written collaboratively by the people who use it, produces a diverse range of authenticated knowledge, including knowledge about well-known academics and their intellectual contributions; students and academics use lending and crowd funding platforms, like Zopa and CommonBond, to raise money for various education endeavors, including paying student fees, and undertaking community and other research projects; global publishers - like Elsevier, Taylor and Frances, Sage, and Springer – invite us to upload and download papers onto platforms; Google Citations, ResearchGate and Kudos encourage us to monitor and strategize the citation of our academic papers; Orcid gives us a unique academic identity – rather like Blockchain, so that all published outputs can be attributed to us uniquely over time and across space and place; Coursera, edX and Udacity host on-line courses from leading universities on their platform – with participants loading up basic biographical data and leaving traces of their learning experience to be turned into data which powers learning analytics.

This is far from an exhaustive list, and there are likely many more to be documented that would extend the range of knowledge production purposes and processes well beyond what I have identified so far. For my purposes here it is to outline an approach to studying platforms so as to show the ways in which new relations between things are created, how they open out new worlds of possibility, and depend upon devices that attribute value to action.

Platforms, Evaluative Infrastructures and the Academy

Higher education institutions around the world are under pressure to become more efficient in their academic and administrative activities, to reach out to their wider societies to engage and have an impact, and to generate significant revenues for their national economies, regions and cities. A range of platforms have become ubiquitous within the academy and the sector, whilst older forms of knowledge production and circulation are being radically transformed as a result of their proprietary approach to platforms able to generate new sources of profit.

Process	Old Form	New Form	Political Economy	Algorithmic Governance	Accounting/Value
Curating knowledge	Book - encyclopedia - e.g. Encyclopedia Britannica	Web-based wiki to create a global encyclopedia in multiple languages - e.g. Wikipedia	Open platform Collaboration and sharing; Expertise to create pages drawn from within global community	Number of visits of pages (clicks); BOTS and other algorithmic tools manage platform	Volume of visits generates trust account is correct; pages flagged when accuracy to be checked [ACCURATE/ACCOUNT]
Publishing knowledge	Paper-based journals specialising in refereed knowledge in the sciences, technical and medical information, e.g. Elsevier, Springer, Sage	Web and paper-based journals sciences; growing range of information and research management tools located on their platform, e.g. Elsevier	Proprietorial platform with closed API; knowledge created by experts and peer-reviewed for free; ownership signed over to the publisher; information systems generate analytics	Number of downloads and citations of papers; network analysis of researchers; throughput from pre-published early work to final output	Downloads and citations of papers; impact of paper and journal; social media (e.g. PlumX Metric); sale of research and management analytics to university managers [AUTHORIZED EXPERTS]
Teaching and learning knowledge	Distance education - a division within a university or sole mission; enrol students on courses - degree or professional development	Massive Open Online Courses (MOOCs) - e.g. Coursera - a venture-capital start-up by Stanford professors; courses developed by university professors; open to large numbers students globally	Proprietorial platform - in case of Coursera , venture capital backed; course materials developed by professor and university and placed on platform; students register for a fee; analytics collected sold	Clicks; setting up a discussion thread; likes of threads; plagiarism detectors of student generated content; visits to activities; time on content (e.g. podcasts, YouTube); quizzes; tests	Total number of students enrolled; reputation of university/professor; analytics generated by students' learning; most 'liked' students spotted by recruitment firms [TALENTED LEARNER]
Professional profiles and employment	Careers advice in universities; recruitment and employment services	Social networking services on web-based platform, e.g. LinkedIn links employers and job seekers	Proprietorial platform with closed API; multi-sided market; free services and charging services	Likes; skills recommendations and endorsements; profiles; metrics such as top skills	Trust in individuals generated by the network; network effects create large volumes of data which can be sold [GRADUATE EMPLOYABILITY]
Financing knowledge creation and distribution	Student loans from banks, government-backed loan company, government funding, university or college, Research funders	Peer-to-peer loans for education activities, such as mobility schemes and student fees, e.g. Zopa ; LendingClub Crowdfunding education activities, e.g. Digventures	Proprietorial platform with closed API; multi-sided bringing lender and lender, donator and donatee , together	Lendee assessed by using algorithm for assessing risk for investors. Crowd-funder shows targets; numbers donators; size of donation.	Trust generated through reputation analytics; trust through honouring promises to donators; financial regulator have oversight in the UK. [SOCIALY-MINDED FINANCE]
Quality of university teaching and research	Government regulated Quality Assurance Agencies - national, regional, global, or privately regulated, e.g. MEA programmes.	University rankings data uploaded by institutions then ranked using an ordinal scale, e.g. Times Higher World University Rankings	Proprietorial platform with closed API; multi-sided market -upload of data from institutions, newspaper circulation, specialised reports behind paywalls.	Numbers of citations in international journals; ratios of teacher to students; peer rating of reputation; % of international students and faculty	Reputation generated through hierarchical ranking; development packages sold to universities to improve performance; sale of newspapers [GLOBAL UNIVERSITY]

Table 1: Knowledge Production, Platforms and the Contemporary Academy

In this section I elaborate on six different knowledge production purposes, their distinct political economy, forms of algorithmic governance, and accounting, to explore what new kinds of relations, worlds and value, are being made possible.

Curating knowledge [accurate account]

The best-known platform for the curation of knowledge is Wikipedia. It largely replaces the material form of the encyclopedia, such as Encyclopedia Britannica. Its curation philosophy, and thus political economy, is different to that of the Encyclopedia Britannica, who used expert editors. Wikipedia invites the global

community to be editors of pages of 'accurate' accounts of 'things' – from facts, things and concepts to people and organizations.

Over time, the sheer growth in the number of Wikipedia pages, in multiple languages, and in ensuring that this account is accurate (by this it means pages are not 'tampered' with or 'sabotaged') has meant that the Wikipedia platform is also managed by a complex system of algorithmic governance alongside committed human 'wikipedians' who contribute their free labour. Wikipedia states that it is "...written collaboratively by largely anonymous volunteers who write without pay. Anyone with Internet access can write and make changes to Wikipedia articles" (Wikipedia, 2018).

Of the platforms reported in this chapter, Wikipedia is the most 'open' and truly global knowledge-production platform. It was launched in 2001 using wiki technology. A wiki is a platform on which users can collaboratively modify the content and structure of a page from a web browser. What distinguishes the wiki is that there is no defined owner or leader; instead its structure and content emerges according to the needs of the authors and users. In other words, a wiki enables communities of editors and contributors to write documents collaboratively.

Wikipedia is also one of the most popular of the global platforms. According to statistics provided by Alexa Internet², as of October 2017 Wikipedia was the 5th most popular website in terms of visitor traffic, with a monthly readership of 495 million people; it hosted 5 1/2 billion articles in English. The volume of visits, warnings that entries have not been double checked by the Wikipedia community, and links to other published work by authorized experts, all generate trust, and as a result is a proxy for its value to the communities it serves. Its value is also affirmed by the education world of students, teachers, administrators and researchers across the social sciences, sciences, engineering, humanities, arts and medicine, who regularly consult Wikipedia with a myriad of knowledge questions.

However, despite Wikipedia being open and free, Geiger (2017) argues Wikipedia is an increasingly complex algorithmic system that is barely legible to anyone other than the expert 'Wikipedian' in the editing community. Yet as Geiger, a longtime volunteer and ethnographer of Wikipedia, points out, the organizational culture of Wikipedia is so deeply intertwined with various data-driven algorithmic systems which Wikipedians rely upon to help manage and govern the 'anyone can edit' encyclopedia at a massive scale, that insiders forget that this is a highly complex system that requires a high level of expertise to enter there. He notes: "...the bots, scripts, tools, plug-ins and dashboards make Wikipedia more efficient for those who know how to work with them, but like all organizational cultures, newcomers must learn them in order to be able to participate" (Geiger, 2017: 1). As a result, Wikipedia is in danger of rapidly becoming a black box, even though it is one of the few examples of a very open platform.

Publishing knowledge [authorized expertise]

² Alexa Internet, Inc. is an American company based in California that provides commercial web traffic data and analytics. It is a wholly owned subsidiary of Amazon.com

Academic publishing is also experiencing a revolution as the big publishing houses, like Elsevier, Sage, Taylor & Francis and Springer, confront the new possibilities for academics publishing their scientific and other work afforded by digital technologies (Muellerleile, 2017). Over the past 5 to 10 years, the big publishers have begun to transform their business models using the computational capabilities of algorithmic tools, whilst connecting knowledge producers to journals, libraries and other specialist users.

The platform enables knowledge production, its circulation and consumption to be paced up through the capacity of the new platforms to manage workflow, host databases to find peer reviewers, use automated systems to send reminders, provide upload sites to submit and resubmit papers and reviews, and suggest alternative sources. Importantly, large servers enable the publishers to hold huge archives in digital form to be read at any one point in time by thousands if they so wished. A back-end will tell the publishers who downloaded what, when, in what country, and which institution. It can track citations, and what sells well. And it can use these analytics to profile and promote its 'hottest' scientists, and which papers and ideas are 'trending' on social media sites.

All this is a far cry from the early modern academic journal limited to some 100 in around 1700 (Tenopir and King, 2009). Fast-forward to the beginning of the 21st Century, and estimates are there are around 24,000 active refereed journals around the globe (Larsen and Ins, 2010). Until recently, the political economy of publishing looked rather like this: experts wrote their papers, which were then vetted by peers. At this point, ownership of the paper was then signed over to the publisher, who then printed it in paper form, and sold it back to libraries and individuals through a subscription. Only more recently have individuals been offered the opportunity to buy their paper for a substantial fee and have it immediately available to the wider community, under what is called open access.

Digital platforms have enabled publishing houses like Elsevier, one of the oldest (established in 1880 in the Netherlands) and largest in the world, to remake themselves into a 'information solutions manager' and 'information and analytics company' (Elsevier, 2018). Elsevier, along with Springer, Taylor and Francis, Sage, and Wiley Blackwell (the big 5), own 50% of the academic publishing market. Of this 50%, Elsevier has a 16% share, making it the largest of the big 5 in publishing scientific, technical and medical information (Laviviere et al., 2015). Its flagship journals include *The Lancet* and *Cell*. With a profit margin of some 37% (RELX, 2016) from around 420,000 articles in 2,500 journals and 900 million downloads annually, it is easy to appreciate what is at stake when the publishers are faced with the possibilities of more open science.

Elsevier's strategy has been to invest in digital infrastructures, particularly through acquisitions. In 2012 it purchased Pure from Atira, a provider of software and tools to help academic institutions and researchers manage and improve their research outputs. Pure was used by the research-intensive universities in the UK, to manage their Research Excellence Framework (REF) submissions. Pure promises research managers an up-to-date and dynamic picture of funding sources, research groups, collaborations, citations and commercial activities (Elsevier, 2015: 1).

In 2013, Elsevier bought Mendeley, a reference manager for published papers and books, described by Elsevier as an academic social network. Observers argue that this acquisition was intended to destroy the open science business model (sharing papers in a scientific community); it also enabled Elsevier to acquire the user data that Mendeley had generated. In 2016, Elsevier purchased SSRN (Tucker, 2016), a website-based repository that specialized in preprints and working papers. Elsevier now promotes SSRN as 'sharing tomorrow's research today', closing the loop between pre-published and published work, in turn enabling it to detect early trends in the life-cycle of scientific knowledge production and potential science stars.

Elsevier's 'single integrated digital marketing platform' (Elsevier, 2018) is now a one stop shop in that it is a site to (i) upload manuscripts, (ii) host peer reviewed papers to be bought on subscription; (iii) buy management 'solutions' (SCOPUS, ScienceDirect, Mendeley, Evolve, Clinical Key and Reaxys) for scientists, health professionals, and students worldwide. Its latest collaboration with Adobe (Adobe campaign and Adobe Analytics within Adobe Marketing Cloud) is aimed at standardizing and tying information together from all regions of the world to ensure that it can build specific templates for specific sectors whilst improving regulatory oversight across those regions (Elsevier, 2018). However its main claim in the market is around 'authorized knowledge'; this authority is dependent on processes like blind peer review, the acknowledged authority of editors, and rates of rejection. Trust is thus generated through the importance attached to peer review, and the proprietary nature of access, with the idea of 'authorized expert' central to its ongoing business model (Muellerleile, 2017).

There are multiple ways in which ac/counting and value are generated; from downloads, citations of 'papers', numbers of tweets on a paper on social media in the alternative metrics economy, and impact factors. All these of course power the other value economy; exchange value and profit making, and here the different publishing houses are also in competition with each other, as well as with the open access movement.

Teaching and learning knowledge [talented student]

Massive Open Online Courses, known as MOOCs, sit on platforms with the promise of 'free' courses to students from around the globe, taught by (mostly) well-known professors from well-known universities. Students generally do not need pre-requisites for taking a course, and nor do they need to be 'registered' in the formal sense in which universities understand this concept. Its older form, distance learning, is now seen to be in jeopardy by this new form. However since MOOCs have not, until more recently (see Coursera's recent profile), offered a recognized credential (which is where the social value of learning is established), MOOCs have largely emerged as expensive platform-based teaching and learning activities in search of a business model.

MOOCs burst onto the scene in 2012, promising to revolutionize teaching and learning using Web 2.0 digital technologies: they are an assemblage of ideas, people, institutional reputation and devices; professors,

administrators, video, podcasting, embedded links, discussion threads, quizzes, assignments on a purpose-built platform that puts learners, teachers, administrative expertise, engineers and marketing experts into a relationship with each other. Leading US universities - Stanford, Harvard, Yale and MIT – were at the forefront of the MOOC revolution. Top MOOC platforms to emerge include Udacity, edX, and FutureLearn; a myriad of others have since joined, including Fun, MiriadarX and OpenClassrooms. Dedicated platforms have since emerged as intermediaries to list MOOC classes from MOOC providers, much like the search and compare functions for buying and selling a services, from flights to cars.

Coursera was founded in 2012 by computer science professors, Andrew Ng and Daphne Koller; it drew on their experience of a very large, on-line, course on Artificial Intelligence in 2011 at Stanford (Coursera, 2018). Coursera's political economy follows much the principle of Silicon Valley start-ups; secure venture capital money, grow fast, and figure out how to turn a profit. The initial startup raised an initial \$16 million in venture capital funding. To date the company has secured \$146.1 million in funding (Coursea, 2018). Coursera's on-line learning offer is described as: (i) courses, (ii) specialisations, and (most recently) (iii) degrees, developed by well-known professors in leading partner universities in areas such as engineering, humanities, medicine, biology, social sciences, mathematics, business, computer science, digital marketing, data science, and others. Growth in terms of student numbers has been spectacular. As of October 2017, Coursera had more than 25 million registered learners, 149 partner institutions, more than 2,000 courses, 180 specialisations, and 4 degrees. Over time Coursera has adapted its business model; in 2016 and 2017 respectively, Coursera added Coursera for Business facing into the corporate e-learning market with customers such as L'Oreal and Boston Consulting, and Coursera for Governments and Non-Profits with partners in countries like Pakistan, Singapore, Kazakhstan and Malaysia.

Despite being described as 'free' (their strapline says – join a MOOC for free, all of Coursera's online learning incur a fee. Courses (4-6 weeks) cost anywhere between US\$29-\$99; specialisations (4-6 months) cost \$39-\$79; and degrees (masters only – 1-3 years) cost \$15,000-\$25,000. In 2013, Coursera reported generating US\$1million in revenues; in 2016 like the other MOOD providers, they began charging for grades and assessments.

The most striking feature of Coursera's model is that the organisation least likely to make money is Coursera's partner university. This has led some to speculate that either the universities are using MOOCs to either promote their brand, or as tasters to recruit students into fee-paying courses later. For all Coursera's talk of access to higher education studies in low income countries in their promotion literature, the typical profile of a Coursera student is one who is located in the US, is male, white and with a degree (Sparke, 2017)

Coursera is dependent on the reputation of the institutions it is working with, valorizing this reputational value as part of their marketing. Coursera leaves the design of the courses up to the individual institutions within broad guidelines; the universities fund course development and provide on-line tutoring. And whilst it also claims no intellectual property rights to the courses, believing that the institutions should control the content completely, the bottom line is the video-based course material only works on the Coursera platform and thus

is only available (open) when Coursera chooses to open the course. The institution thus might own the material, but if it is not accessible, then in effect ownership really does not matter.

Users of the platform leave traces (clicks, likes, quizzes) that generate visible profiles for students (as talented/ to be approached by recruiters) while data becomes a new area of research called 'learning analytics'. This back-end learning data, owned by Coursera (in contrast to the course itself), is mineable and saleable to text producers and learning providers.

MOOC platforms frame the possibilities for teaching and learning; its sheer scale, tends to lead to standardization. However the capacity to re-watch or re-read content, to slow down or speed up video and audio, to place hyperlinks into content and other exercises, to enable multiple languages in the discussion threads, and to upload content, shows the potential for new forms of teaching and learners.

Professional profiles and employment [graduate employability]

LinkedIn is a US-based platform specializing in social networking services organized around professional profiles, employment and employability. It seeks to replace an earlier form of careers service with its advice, recruitment and placement function. Its core business is now "...digitally structuring the labour market and selling data products related to employability" (Komljenovic, forthcoming: 8). This business model has emerged over time, and is the result of network effects.

Founded in 2002 and launched in 2003, LinkedIn is used mainly for professional networking, including employers posting jobs, and job seekers posting their CVs. As of 2015, most of the company's revenue came from selling access to information about its members to recruiters and other sales professionals. By 2017 LinkedIn had 500 million members in 200 countries, out of which more than 106 million members are active³. The site is also available in 24 languages. LinkedIn filed for an initial public offering in January 2011 and traded its first shares on May 19, 2011, under the NYSE symbol "LNKD". On 2016 Microsoft acquires LinkedIn for \$26.4 billion; this was one of the largest amounts paid for a tech company.

LinkedIn now runs a mixed economy business model; there are services offered for free (e.g. people you may know; Pulse, Feed) enabling a user to stay connected and informed; a list of other free services are aimed at advancing a career (e.g. Jobs, Job Search, How You Rank; Who has Viewed your profile, Endorsements). There are also monetarised services (such as LinkedIn corporate solutions, job postings, Job Seeker, sponsored updates and professional subscriptions).

LinkedIn allows members (both workers and employers) to create profiles and "connections" to each other in an online social network which aims to represent real-world professional relationships. Members can invite anyone (whether an existing member or not) to become a connection. The "gated-access approach" (where

³ The site has an [Alexa Internet](#) ranking as the 20th most popular website (October 2016).

contact with any professional requires either an existing relationship or an introduction through a contact of theirs) is intended to build trust among the service's members. According to the New York Times, US high school students are now creating LinkedIn profiles to include with their college applications.

Komljenovic (forthcoming) has developed a detailed account of LinkedIn. She describes a pattern of constant experimentation of products and services, some of which continue and some which are taken down. She also describes the growing dependence of the universities on LinkedIn, and the ways in which LinkedIn has begun to tailor its business toward the 'employability agenda' seen to be shaping within places like the UK. LinkedIn is also active in influential global forums, like the World Economic Forum, shaping the agendas of the world of business.

Financing knowledge creation and distribution [socially-minded finance]

Platforms are at the heart of the new financial products being promoted in the education world. Funding has become a major issue in the higher education sector on multiple fronts. At the level of the individual student, the cost of tuition in countries like the USA and England is very high, with higher education increasingly paid for by households and not the state. Yet holding an undergraduate degree is increasingly the entry level requirement for even routine jobs leading commentators like Brown et al (2011) to remark that having a degree is important not as a guarantee of a job, but simply to stay in the race. Similarly, at the institutional and sectoral levels, there is a limited funds for research as well as for specific community projects.

New opportunities are being opened up by platforms as intermediaries for putting seller and buyer, lender and lendee, creditor and debtor, into an exchange relation around finance. These new financial products are also being promoted by global actors; in 2015, Parthenon EY⁴ published a report on Student Finance (Abdo et al, 2015), funded by the International Finance Corporation⁵, canvassing new modes of student finance, including peer-to-peer and crowdfunding. Both are dependent on platforms to bring the investor-debtor, donator-fundraiser into a relationship, via the platform. In the United Kingdom, owners of peer-to-peer lending and crowdfunding platforms are now regulated by two different financial regulators (Langley and Leyshon, 2017).

Zopa was one of the first peer-to-peer lenders established in 2005 in the UK. Via a platform, individual lenders provide capital directly to individual borrowers. Since its establishment, Zopa has lent more than £2.95 billion in the UK with an average loan of around £13,000, though is currently unclear how much goes to education projects. In the USA, peer-to-peer lending has also become popular, with the main platforms being LendingClub and Prosper. Commonbond and Sofi are two platforms offering student loans via peer to peer. Commonbond offer graduate student loans and student loan refinancing at a fixed interest rate with

⁴ Ernest and Young, the global accounting firm, bought Parthenon – an education firm – to expand its knowledge of and expertise in the education sector.

⁵ The International Finance Corporation is the private lending arm of the World Bank Group. Since early 2000 it has strategically pursued opening up education as an emerging market, lending to venture capital corporations seeking to enter the higher education sector, such as Laureate Education.

repayments over a negotiated period of time. For investors, they get a fixed interest rate after a fee is extracted by the company owning the platform. Just as in peer-to-peer lending, the investor takes the risk of default. Peer-to-peer lending emphasizes not just the economic, but the social, returns (Tooker and Clarke, 2018) SoFi funds a very similar service to Commonbond in the education sector.

Crowdfunding is also promoted as a new way in which funds can be raised for education projects. Kickstarter and Indiegogo were early platforms. These are reward-based sites; people can pledge money to a new project and agree on a particular reward from a set of offerings. A variation of crowdfunding is Kiva's Donation-Based Crowdfunding; it raises donations to help the fundee undertake an initiative they have promoted as important, or making some kind of personal or social contribution. In 2016, UK university professor were reported in the Guardian (Murray, 2016: 1) to have raised funds for projects; this included an archaeologist who used the crowdfunding platform DigVentures to raise more than £25,000 for a archeological dig. University students are reported to be use sites such as Hubbub, GoFundMe and Indiegogo to raise money for studies; Packham (2016) reports cases that include a doctoral student who launched a campaign to crowdfund her PhD in urban choreography. What is not clear is the scale of the activity and who tends to be involved as either seller or buyer. In this case the black-boxing of the platform tends to conceal the activity as well as the losses incurred.

In both peer-to-peer lending and crowdfunding, trust is generated by confidence about risk assessments made by lenders, in the reputation analytics attached to the platform itself, the volume of donators, through evidence of honouring promises to repay, in the ways in which differences are erases through the valorizing of the social, and by the fact that these activities are governed by the newly established financial regulators.

Quality of university teaching and research [global university]

The quality of higher education institutions – from their teaching to their research - has historically been a national affair, managed combinations of government regulated quality assurance agencies, internal audits of different departments undertaken by the university, or professional associations. That quality would become a matter of public consumption can be litmussed in the rise of good university guides in the 1990s onwards, in this case sold to a new population called students as consumers. However it was not until the early 2000s that good university guides became a global matter. The quality of teaching and research is thus elided with where an institution is on the global rankings, and thus a 'global university' is one who sits in the top 10, 50, or 100 of the ranked universities.

The first global ranking of universities was developed in 2003 by the Shanghai Jiao Tong University, China, to help China understand the characteristics of top US universities, with a view to setting out to emulate them. Data was central to this endeavor; the Web of Science provided information on publications and citations. Institutional data – including Nobel Award winners, were placed in the mix – as was the international nature of the faculty.

The ongoing political economy of global rankings is dynamic and changing rapidly as commercial partnerships turn sour, new competitors emerge, and different communities raise questions about the technical and political details of what gets counted, how, and by whom. This can be seen in the churn in the Times Higher, a newspaper publisher, which has generated major profits from university data (loaded up for free on the Times Higher platform by the universities themselves). In 2004 the Times Higher Education (THE) and Quacquarelli Symonds (QS) World University Rankings (THE-QS) were launched, but was soon followed by a spectacular rift between the two partners in 2009. Styling itself as; "...the global authority on higher education performance" (Times Higher Education website), the Times Higher Education (THE) launched a reinvention of itself as a global university ranking expert, THE initially partnered with (or was "powered by") Thompson-Reuters in 2009.

By early 2010, the European Commission announced its own challenge to the global rankers with U-Multirank, a European-driven ranking system. And a mere four years later, just after U-Multirank was finally released, the THE/Thomson joint venture with Thomson Reuters (Canada's leading corporate brand specialising in information for professionals and businesses around the globe) ended when the THE announced all institutional data collection, previously outsourced to Thomson Reuters, would be expanded and brought in-house, with the work done by a dedicated team of data analysts at THE. Thus we see THE (a media company) partnering with a niche higher education sector firm (2004), then a large global services firm (2009), and then becoming more autonomous (2014) while drawing selectively on Elsevier's Scopus (the main competitor of Thomson Reuters' Web of Science) for bibliometric data (Robertson and Olds, 2017).

The Times Higher's global ranking project sits on a proprietorial platform that enables data to be uploaded from institutions, around a range of indicators of excellence. These indicators, of course, are not only particular constructions, but to some extent they also reflect what is currently being counted by universities, and if not currently counted, then universities will learn to count them in order to do well. These data-driven representations in turn draw from a whole range of proxies of global excellence – from the output in scientific publications, citations, ratios of students to teachers, reputation based data from student surveys, and so on.

Viewed from a governance perspective, algorithms have already generated the first round of data, to be reorganized and recalibrated in a second and third round of slicing, splicing and representation – as new relations are constructed between things, some worlds are opened and others closed as institutions locate themselves in the various commercial strategies of the Times Higher and new valuations and reputation are brokered or put at risk.

Comparing, Platforms and the New Value Economy in the Academy

There is much to be gained from comparing the infrastructures involved in knowledge production and value creation, and how they are changing in subtle and dramatic ways as a result of the rise of digital platforms, big data and their evaluative infrastructures. This chapter has sought to do this in several ways. First, through comparing older forms of knowledge production and value creation, we can see the ways in which platforms

can change the scale and scope of these enterprises to reach a very large number around the globe and make possible new kinds of connections and relations. As a result, new worlds and possibilities are made available, both for buyer and seller, consumer and producer, debtor and creditor. In undertaking this temporal comparison, we can begin to make visible, and explain, the ways in which the new digital platforms, as a particular kind of form, firm and infrastructure, are changing the value economy of the academy.

Second, comparison enables us to hone in the distinct features of platforms, their particular political economies, forms of algorithmic governance, and ways of attributing worth and value, as the basis for exploring how they work (and for whom), and what kinds of effects they produce at the level of individuals as well as the institution and sector. We can see that the nature of the platform infrastructure matters, as well as how it is governed algorithmically. For example we can see Wikipedia enables a new kind of knowledge curation – where editing expertise is drawn from the global community, and not just experts employed by the publishing houses. Yet at the same time, the sheer scale and scope of Wikipedia, places greater emphasis on algorithmic governance, so that even this ‘open’ platform is now less accessible than it promises.

Most of the platforms considered in this chapter have some aspect of their platform closed and proprietary, which it is hoped will enable them to generate revenue streams and profit. These range from mining data traces - such as Coursera, selling CVs such as LinkedIn, or selling particular kinds of rankings data via newspaper circulation, or high tariff advice to interested universities. Some revenue streams occur because the services (not all) are behind a paywall (Elsevier, Coursera), or as a form of rent calculated as a percentage of the cost of the transaction (Zopa).

Yet these business models do not come preformed; rather, there appears to be a great deal of experimenting in the sector, as new kinds of knowledge producers and forms of knowledge production vie with existing models and their different worth and value economies. Establishing trust in the product or service is critical, as financial services like Zopa, and publishing houses like Elsevier, well know. Other platforms are somewhat unstable, as their business model has yet to emerge more clearly from the start-up, as in the case of Coursera. Its radical potential, as a disruptor of teaching and learning in high value institutions, is contained and constrained by its need to offer credentials – which is at the heart of the value and worth economy of the university.

As a result, we can see some diversity in the political economy of platforms, their forms of algorithmic governance, and how worth and value are assigned and valorized. This is a dynamic ecology which is constantly changing as a result of experiments in services, seeing off rivals, acquiring new capability, responding to the crowd out there, and building communities of trust in alternate forms of value creation (as we saw with LinkedIn and Elsevier).

Despite this diversity of business models, all platforms are dependent on a particular evaluative infrastructure, and it is here that the engine at the heart of the platform is revealed. Each of these platforms has an evaluative infrastructure composed of an ecology of devices, that in some way also refer to the purpose of the

knowledge production activity at the heart of the business model. For the big publishing firms, to ensure their rights over authorizing expertise, they ensure systems of peer review are built in their protocols, and in so doing, draw upon earlier systems of value and worth. Similarly peer-to-peer lending draw upon risk protocols to determine the cost of lending.

There is growing agreement that the platform is a new organization form in capitalist production, giving rise to the name, platform capitalism. What does this mean for the academy, its expertise, its claim to autonomy, and the idea of being a public good institution? By comparing old with new, and the diversity of purpose and processes, we can also see that this is a new world in the making that is yet to stabilize and be made legible. Comparing also pushes us to social justice questions, about what counts, what should count, and what is to be accounted for. As Jasanoff (2017: 1) has recently observed, "...numbers and justice have long kept company, as the paired words counting and accounting attest". However, this was largely the preserve of states. Today, with the ubiquity of recording tools of all kinds, and the rise of non-state actors, new questions emerge about visibility, interests and credibility. There is also a new urgency around what Jasanoff (2017: 6) calls civic epistemology; ways of knowing that bring to the forefront the question of political accountability. In my view this is an important project for the academy, if it is to claim its place as a public institution concerned with knowledge production, its circulation and consumption in an era of platform capitalism. In order to do this, a great deal more work is required to make more visible the diverse, dynamic and complex ways in which platforms are shaping the terrain for new forms of knowledge production, and what it means for the academy. This requires new questions, concepts and methodological approaches so as to generate new knowledge about their possibilities as well as challenges to the academy as we knew it.

References

- Abdo, M., Malhotra, R., Assomuli, A and Bjarnason, S., (2015) *Student Finance: Learning from Global Best Practice and Financial Innovations*, Washington: International Finance Corporation, World Bank Group.
- Burrows, R., and Savage, M., (2014) After the crisis? Big data and the methodological challenges of empirical sociology, *Big Data and Society*, April –June, pp. 1-6.
- Elsevier (2012) Elsevier acquires Atira, a provider of research management solutions, Elsevier Press Release, August 15, [available at www.elsevier.com - last accessed on 30 January, 2018]
- Elsevier (2018) Elsevier finds one global voice [available at www.elsevier.com - last accessed on 30 January, 2018]
- Espeland, W. N., and Sauders, M., (2016) *Engines of Anxiety: Academic Rankings, Reputation and Accountability*, New York: Russell Sage Foundation.
- Geiger, R. S. (2017) Beyond opening up the black box: investigating the role of algorithmic systems in Wikipedian organizational culture, *Big Data and Society*, July-December, pp. 1-4 DOI: 10.177/2053951717730735
- Gillespie, T. (2010) The politics of 'platforms', *New Media and Society*, 12 (3), pp. 347-364
- Jasanoff, S., (2017) Virtual, visible and actionable: data assemblages and the sightlines of justice, *Big Data and Society*, July-December, pp. 1-15.

Hazelkorn, E., (ed.) (2017) *Global Rankings and the geo-Politics of Higher Education*, London and New York, Routledge.

Komljenovic, J. (forthcoming) Higher education actors as prosumers: the case of LinkedIn reassembling the university, *Globalisation, Societies and Education*,

Kornberger, M., Pflueger, D., and Mouritsen, J., (2017) Evaluative infrastructures: accounting for platform organisation, in *Accounting, Organisations and Society*, 60, pp. 79-95.

Langley, P. and Leyshon, A., (2017) Platform capitalism: the intermediation and capitalisation of digital economic circulation, *Finance and society*, 3 (1), pp. 11-31.

Larsen, P. and Ins, M., (2010) The rate of growth of scientific publications and the decline in coverage provided by the Social Citation Index, *Scientometrics*, 84 pp. 575-603.

Laviviere, V., Haustein, S., and Mongeon, P., (2015) The oligopoly of academic publishing in the digital era, *PLOS/One*, 10 6, DOI:10.1371/journal.pone.0127502.

Lobo, S., (2014) Never mind the sharing economy: here's platform capitalism, [available at <http://networkcultures.org/mycreativity/2014/10/16/never-mind-the-sharing-economy-heres-platform-capitalism/> - last accessed on 16 January, 2018].

Muellerleile, C., (2017) Open access panacea: scarcity, abundance and enclosure in the new economy of academic knowledge production, in D. Tyfield, R. Lave, S Randalls and C. Thorpe (eds.) *The Routledge Handbook of the Political Economy of Science*, New York: Routledge.

Murray, J., (2016) Crowdfunding: the new buzzword for academics needing research money, *Guardian*, 25 October, [available at <https://www.theguardian.com/education/2016/oct/25/crowdfunding-academic-research-money-brexite-bees-isd> - last accessed 30th January, 2018].

Novoa, A., and Yariv-Mashal, T. (2003) Comparative research in education: a mode of governance of a historical journey? *Comparative Education*, 39, pp. 423-38.

RELIX group (2016) Annual Report, [available at https://web.archive.org/web/20170316204334/http://www.relx.com/investorcentre/reports%202007/Documents/2016/relxgroup_ar_2016.pdf - last accessed on 17th January, 2018].

Packham, A. (2016) The students crowdfunding their tuition, *Guardian*, 25 April [available at <https://www.theguardian.com/education/2016/apr/25/meet-the-students-crowdfunding-their-university-tuition-fees> - last accessed 30th January, 2018].

Porter, T., (1995) *Trust in Numbers*, Princeton, NJ., Princeton University Press.

Robertson, S. L., and Dale, R., (2016) Comparing education policies in a globalizing world: methodological reflections, in A. Hadjar and C. Gross (eds.) *Education Systems and Inequalities*, Bristol: Policy Press.

Robertson, S.L. and Komljenovic, J., (2016) Unbundling the university and making higher education markets. In A. Verger, C. Lubienski and G. Steiner-Khamsi (eds.) *World Yearbook of Education 2016: The Global Education Industry*, London and New York: Routledge.

Robertson, S., and Olds, K., (2017) Rankings as Global (Monetising) Scopic Systems, in E. Hazelkorn (2017) *Global Rankings and the geo-Politics of Higher Education*, London and New York, Routledge.

Sparke, M., (2017) Situating cyborg knowledge in not so borderless on-line global education: mapping the geo-social landscape of a MOOC, *Geopolitics*, 22 (1), 51-72.

Srnicek, N., (2017) *Platform Capitalism*, Cambridge: Polity Press.

-
- Steiner, C., (2012) *Automate This: How Algorithms Took Over Our Markets, Our Jobs and the World*, New York: Penguin.
- Steinmetz, G., (2004) Odious comparisons: incommensurability, the case study and 'small N's' in sociology, *Sociological Theory*, 22 (3), pp. 371-400.
- Tenopir, K. and King, D., (2009) The growth of journals publishing, in B. Cope and A. Phillips (eds) *The Future of the Academic Journal*, London: Chandos.
- Thomas, S., Nafus, D., and Sherman, J., (2018), Algorithms as fetish: faith and the possibility of algorithmic work, *Big Data and Society*, January-June, pp. 1-11.
- Tooker, L. and Clarke, C., (2018) Experiments in relational finance: harnessing the social in everyday debt and credit, *Theory, Culture and Society*, pp. 1-11, DOI: 10.1177/0263276417746465
- Tucker, D., SSRN celebrates its one-year anniversary at Elsevier, (available at <https://www.elsevier.com/connect/ssrn-celebrates-its-one-year-anniversary-at-elsevier> - last accessed on 17th January, 2018].
- Van Dijck, J., (2014) Datafication, dataism and dataveillance: Big Data between scientific paradigm and ideology, *Surveillance & Society*, 12 (2), pp.197-208.
- Venturini, T., Jacomy, M., Munier, A., and Latour, B., (2017) An unexpected journey: a few lessons from science Po medialab's experience, *Big Data and Society*, July-December, pp. 1-11.