

CHAPTER 13

A Workers' Inquiry into Canvas and Zoom: Disrupting the Algorithmic University

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Introduction

The pandemic has created the ideal circumstances for corporate consultants and 'edtech' venture capitalists, textbook publishers and online education advocacy groups to further automate, outsource and rationalise academic labour. This is being accomplished by widespread deskilling and automation of teaching in colleges and universities that harkens back to the massive privatisation of K-12 education in New Orleans following the 2005 Hurricanes Katrina and Rita and the pandemic.¹ (BCG 2020; Bay View Analytics 2020; Williamson 2020; Hogan and Williamson 2020) In 2020, as self-isolation and quarantines during the 2020 Covid-19 pandemic have suppressed the transmission of the virus, the turn toward remote work using new telecommunications technology such as the Canvas learning management system (LMS) and the Zoom teleconferencing app threatens to also sweep away many of the barriers to the spread of another epidemic – the digital automation and deskilling of teaching in higher education (Bailey 2020; Online Learning Consortium and Cengage

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2020). What we currently face is a confluence of forces that is accelerating the attack on the very academic labour of faculty in higher education, an attack that must be understood in order to devise the necessary tactics and strategies to counter and resist it.

Online education (OLE) in the US has been making slow and steady gains for the past decade. The number of students who have taken at least one OLE class grew from 8 percent in 1999–2000 to 18 percent in 2017 with twice as many in public institutions as in private (National Center for Education Statistics 2011; 2019). Nevertheless, OLE has taken a hit due to devastating reports of the ‘online performance gap,’ in which online courses in every academic discipline result in higher failure and drop out rates than in person courses, and the much hyped Massive Open Online Courses (MOOC) defeated by faculty at my campus, San Jose State University, after its first and only semester in 2013 (Johnson and Mejia 2014). The widespread reliance on conferencing platforms such as Zoom to move nearly all higher education into OLE has accelerated the process of imposing a new technical composition of academic capital on higher education. This necessitates that faculty and other academic workers shift our organising tactics, strategies and objectives to address the changing organisation of academic labour.

Conferencing platforms like Zoom and LMSs such as Canvas, which are driving OLE, are not neutral technologies. The emergence of OLE coincides with decades of neoliberal assaults on higher education through the commodification of academic knowledge production, adjunctification, austerity, privatisation, entrepreneurialisation and the shifting of costs to students and their families through skyrocketing tuition and fees paid for by massive personal debt. The relentless drive for quantitative assessment of research and teaching is applying intense pressure to further commodify and rationalise cognitive labour (Harvie 1999; 2006) resulting in ‘redundancies’ of tenured faculty such as those seen at the University of Leicester in the UK where faculty went on strike in 2021 and launched a global boycott of the university (BBC 2021). These represent the external factors placing relentless pressure on higher education to make it more effectively serve capital (Ovetz 1996; Harvie 1999, 106; De Angelis and Harvie 2009; Harvie, Ivancheva and Ovetz 2022). Alongside these external factors is the equally critical internal factor of the fragmentation and rationalisation of academic labour by OLE that threatens to undermine the very craft once thought insulated from attack – the human skill of teaching (Noble 2003).

This chapter offers a workers’ inquiry of Canvas and Zoom in the emerging new technical composition of academic capital as the latest phase in response to the recomposition of the power of academic labour that accelerated in the 1960–70s. OLE is predicated on fundamentally shifting teaching and learning from assessment of *comprehension* of content knowledge to measurement of *proficiency* in task completion (Ovetz 2020a). There are two critical aspects to this shift. First, it is made possible by the emergence and ubiquity of artificial

intelligence (AI) and communications technologies that are being used to reduce the reliance on full-time tenure track faculty while rationalising academic labour. Second, it is intended to produce more productive self-disciplined students as student labour power to meet the growing demand for precarious 'platform' or 'gig' work. The rise in organising among adjunct faculty in recent years will not be sufficient in itself to halt the emergence of this new technical composition of academic capital by continuing to rely on contract unionism that merely trades wages and benefits for control over academic labour. To know how to organise it is essential to understand the terrain on which academic workers now find ourselves.

A workers' inquiry (Ovetz 2020b) into the new technical composition of academic labour in the university understood through the lens of class composition theory is critically needed. A workers' inquiry is a method for studying the new technical composition of capital which reorganises work as a strategy to decompose the power of workers from previous successful struggles in order to recompose the relations of production so as to restore control over production. This new technical composition is immensely valuable in serving capital's need for workers sufficiently disciplined to carry out platform labour managed by remote algorithmic management tools. Understanding each phase of the class composition is critical for workers to devise new tactics and strategies to recompose their strength and shift power back in their favour (Ovetz 2017).

The Faculty Appendage to LMS

To understand the role of Canvas and Zoom in deskilling and disciplining academic labour we can turn to Marx's analysis of the technical composition of capital² (1867, 481). His analysis of rationalisation was further applied by Braverman (1974) to the Taylorisation of craft labour at the turn of the twentieth century. Bringing both Marx and Braverman into the classroom, Foucault (1977) applied rationalisation to education as a strategy for the control and disciplining of academic labour.

The technical composition of industrial work, Marx explained, shows that 'not only is the specialised work distributed among the different individuals, but the individual himself is divided up, and transformed into the automatic motor of a detail operation', thereby transforming the worker into an 'appendage' of the machine and the factory (1867, 481–2). Marx's detailed analysis of the deskilling of craft workers in the rational organisation of industrial production in the factory is entirely relevant to understanding the rationalisation of skilled into deskilled academic labour today.

Braverman showed how the worker is transformed into the machine tender by the rationalisation of industrial labour designed by engineer Frederick Taylor. As faculty labour is assessed and rationalised, course design, delivery and assessment (McCowan 2017, 738) becomes fragmented and the pieces redistributed

to non-faculty academic staff such as content experts, counsellors, course designers, technical support, programmers, and outsourced to textbook and software companies.

OLE is replete with examples of such rationalisation. In February 2017 I received a spam email from Norton with the subject line ‘No time for grading?’ promising ‘our content, your course.’ A May 2020 spam email from Packback further promises the use of AI ‘to improve student engagement for community college students...while also automating some of the administrative faculty burden that unfortunately comes with managing discussion.’ These two companies are not merely pitching their product to engorge their bottom lines but the rationalisation of academic labour by what Harry Braverman described as the ‘separation of conception from execution’ (Braverman 1974, 113–114). He noted how this takes place when ‘the first step breaks up only the process, while the second dismembers the worker as well, means nothing to the capitalist, and all the less since, in destroying the craft as a process under the control of the worker, he reconstitutes it as a process under his control’ (Braverman 1974, 78).

The ‘datafication’ and ‘dataveillance’ built into OLE provides a critical element in the rationalisation of academic labour (van Dijck 2014, 198; Williamson, Bayne and Shay 2020, 351). By transforming the complex multivariate aspects of teaching into tasks that measure the ‘competency’ of students represented in the form of data, OLE serves to operationalise teaching by rationalising it into disassembled components that can be redistributed to specialised staff responsible for highly differentiated technical aspects of the course (Mcfarlane 2011). What Marx and Braverman have taught us is that the rationalisation of labour is not simply about reducing labour costs, although that is of critical concern. The cost of labour is a factor of the *level* of control of labour power. Control is critical if capital is able to transform labour power from potential into actual work. Rationalisation is a strategy for decomposing the power of academic workers in order to discipline and make them work.

Foucault meticulously related how ‘the human body was entering a machinery of power that explores it, breaks it down and rearranges it’ (1977, 138). According to Foucault, the ‘learning machine’ exists for ‘supervising, hierarchizing, [and] reward’ (1977, 147). It breaks down the action of teaching and learning into its key components so that ‘to each movement is assigned a direction, an aptitude, a duration; their order of succession is prescribed’ (1977, 152). Finally, Foucault noted that the labour of the student and faculty are similarly rationalised as the complex supervisory role of ‘the master’ who assesses by the exam is replaced by the serialisation and hierarchisation of each task into a series along ‘disciplinary time’ (1977, 159). Although he died about a decade before OLE was introduced, Foucault might as well have been describing its impact on teaching and learning today.

Canvas and Zoom are two critical tools for implementing deskilling. This new technical composition can be seen in the rapid expansion of OLE run on the Canvas LMS and the delivery of courses through Zoom.³ In order to

understand the current technical composition of higher education a workers' inquiry into academic labour will be explored below by examining the structure and organisation of Canvas and Zoom for the algorithmic management of academic labour.

Canvas and Zoom: A New Technical Composition of Academic Work

A close analysis of the design of the LMS demonstrates how the process of rationalising academic labour is built into the digital architecture of the Canvas LMS. Although faculty appear to have complete autonomy to set up their LMS shell for their course, with a variety of possibilities to match their chosen pedagogy, the very architecture of the LMS is designed to fragment teaching into the delivery of tasks and learning into competency in their completion.

Constructed as a diffused virtual space of an online 'classroom', the Canvas LMS is not intended to simply mimic the in person classroom but replace it with an entirely different logic. Students no longer learn or study but respond to orders called 'prompts' in a virtual space in which their every action is designed to be treated as a measurable task. After 'logging in,' the student moves through the discretely organised spaces of the LMS differentiated by 'modules' that function as timed work spaces in which students write text, post a file, upload a video, download a reading, stream a video, or follow a link to material or work elsewhere, to name a few of the possible tasks. Because these spaces 'open' and 'close' at predetermined times, student work is highly regulated and regimented. A commonly used activity of faculty is to require students to respond to another student's text, work or video post. This not only serves to use students to 'prompt' other students to complete their work, it turns students against one another as little bosses that inform on one another for missing work, such as providing a response to another student's post. In effect, the isolated student virtually moves through the architecture of the LMS, disassociated from personal contact with fellow students, faculty and the physical space of the classroom and campus.

The LMS is designed for the virtually isolated student to self-discipline themselves by completing a sequence of tasks in the predetermined order established by the faculty member, course designer or content specialist. Because each student moves in complete isolation and solitude through the LMS, their 'learning' becomes a series of discrete, disconnected tasks to be completed during the window of time allowed. The apparent similarity of the use of time, such as due dates, to impose work in an in person class is deceptive because the LMS functions to achieve an entirely different immediate objective. Time takes on a different role in OLE by guiding the completion of discrete tasks that substitute for the complex inter-personal relationships that are central features of learning. Because OLE can use AI programmed by technicians to entirely bypass

faculty, time becomes the predominant standard of assessing how students complete the now rationalised components of the curriculum. Just as OLE rationalised teaching into its component parts, the LMS becomes the technology for sequencing these parts and using time to measure the intensity and productivity of the tasks which a student completes. The ability to time is the ability to impose and to measure work. Like Taylor's much despised stopwatch, the LMS is the mechanism for solving the transformation problem of turning student labour power into work.

Timing student work effectively assumes the ability to surveil it. In this way, the LMS serves as a mechanism of surveillance foreseen by Foucault's 'eye that sees without being seen,' today called 'dataveillance' or 'a form of continuous surveillance through the use of (meta)data' (van Dijck 2014, 198). In the LMS, students never know with certainty when they are being remotely observed, tracked, monitored, measured and assessed (Ovetz 2017). LMS software that runs the online class provides virtual 'eyes that must see without being seen' – the twenty-first century digital panopticon (Foucault 1977, 171).

An alternative method of measurement to faculty's perceived subjective assessment of the usefulness of student work is provided by the ubiquitous collection of data in the LMS. Just as teaching is shifted to competency, learning shifts to task completion under the guise of dataveillance. Just as the classic classroom 'made educational space function like a learning machine, but also as a machine for supervising, hierarchizing, rewarding' (Foucault 2010, 147), the LMS was designed as a data driven machine for the imposition of academic work.

Canvas's LMS 'learning machine' provides an unprecedented and rich source of granular metadata on both a student and the faculty's current work that can be used to measure, manipulate, predict, quantify and monetise current and future behaviour (van Dijck 2014, 200). From log in to log out, immense amounts of data are available to faculty, or anyone with administrative access, in Canvas and its integrated apps, as well as employers willing to pay for the data harvested by the emerging field of 'educational data mining' (Desai 2020, 1).

Canvas data is being analysed to connect discussion posts to grades in order to profile the personality traits, or what is called the 'social behavior of students' (Desai 2020, 10). Desai used a 'text mining process' to analyse student data mined from Canvas courses, distributed through the unsecured WhatsApp, and processed and stored on an external database (Desai 2020, 9, 25 and 42). Using the real-time Canvas Online Discussion Analyzer (CODA) interface available as a built in Canvas app, researchers conduct a 'sentiment analysis' on the quality of a student's opinion, connectivity among students and faculty, leadership qualities, friendliness, sentiments of opinion on course issues, and other student characteristics in a single course and across multiple courses (Desai 2020, 10, 34). According to Desai, 'CODA recognises the leading students in the discussions based on centrality measures and keyword usage. Centrality metrics correspond to the influence, leadership abilities, connectedness, and friendliness

in the student network' (Desai 2020, 33). Promising to provide predictive indications of struggling students and the correlation between effort and grades, it also constructs a profile of soft work skills desired by employers and a surveillance tool that could be used by repressive governments.

LMS harvested data is immensely useful for what it tells us about student work. For example, the 'People' window contains a wide range of detailed real-time and historical data on a student's online work. In it, the 'Access Report' provides precise details about every step a student takes across every part of the Canvas site. The 'Analytics' page gives dynamic bar graphs on four types of X-Y axes or tables with precise days and times on each task, number of tasks completed, number of page views, number of actions taken, interactions with instructors and comparisons to the class median on each graded assignment. In effect, the student can be monitored for the efficiency, intensity, productivity and persistence of their work.

The 'Quizzes' tab provides a range of similar aggregate data in spreadsheet format on how each student engaged with every question in a multiple choice exam. Second by second data is available for every action a student takes while completing an exam under the 'Speed Grader' 'Action Log'. An 'Item Analysis' is available which contrasts how each student performed on every exam question, for example, relative to the other two thirds of the class, and includes the variance, standard deviation, difficulty index and a distractor point biserial correlation. This last factor is intended to identify a reliable answer based on each students' answer choice in order to provide an objective measurement that discriminates between a student who mastered the material on the exam and those that did not. This function allows a students' work to be measured in comparison to other students' outcomes rather than assessed by the faculty according to their own personal attributes of learning, which are notoriously difficult to assess and evade comparability and standardisation.

The Canvas LMS is invaluable for generating vast amounts of data on student work habits, which is critical to the deskilling of academic labour and the shift from learning to competency. In the version of Canvas available to me there are literally hundreds of available integrable apps under 'Settings' that I can request to automate virtually any aspect of the course such as inserting standardised content, grade exams, issue badges, access user and exam data, acquire biometrics, assign peer evaluations, take polls, grading papers, post grading comments and tutor.

The apps Dropout Detective and MyCourseEval stand out for their accumulation of data on both faculty and student work. According to the corporate text embedded in the app, Dropout Detective 'integrates with a school's existing learning management systems and analyses student performance and behavior across ALL courses in which they may be enrolled'. The corporate text for MyCourseEval promises to allow real-time student evaluation of faculty by being embedded in the LMS. Both Canvas apps are just two of many intended to provide immediate dataveillance of faculty and students to

evaluate the productivity of their labour by producing daily more than 280 million rows of data. Canvas is hosted on Amazon Web Services servers giving commercial access to mountains of data about student work to anyone who wishes to pay for it. In fact, Canvas's privacy policy discloses the use of cookies, web beacons, and third party hosting to gather, store and link data to 'personally identifiable information' (Marachi and Quill 2020, 421, 423, 425). The integration of data from within and outside the classroom is offered by Solutionpath's StREAM (Student Retention, Engagement, Attainment and Monitoring), which provides a real-time 'engagement score' for students based on in class activity, Radio-Frequency Identification (RFID) card swipes, attendance and even library check outs, providing a ubiquitous surveillance of productivity of all aspects of students' lives (Williamson 2020). Student awareness of the potential of being monitored, even when they are not sure precisely when they are actually being surveilled, is the power of Canvas. This serves as a velvet glove to self-discipline and self-imposed work, which is what makes OLE so valuable as a technology for producing measurable, disciplined labour for platform work. Students who have taken some OLE courses and graduated provide rich data to a future employer of their ability to work and presumably internalise the procedures for working under algorithmic management regimes. The Boston Consulting Group (BCG) and Arizona State University (ASU) asks us to 'imagine the implications for higher education' from the application of 'Amazon's predictive models of human behavior' (BCG and ASU 2018, 3). Perhaps BCG and ASU are unaware that Instructure, the company that owns Canvas, has not just stopped at imagining this integration but is actually doing it.

The persistent problem of student refusal to work can be identified in the high rate of drop outs and F's in OLE courses and poor performance relative to in person classes (Johnson and Mejia 2014, 1; Barshay 2015). This gap is partially attributed to 'difficult to measure' student characteristics such as 'self-directed learning skills,' motivation, ability and time management. Each of these factors can be understood in class terms as tactical refusals of school work (Johnson and Mejia 2014, 8). The prevalence of such refusals raises doubt about whether Canvas has effectively solved the transformation problem of turning labour power into work.

As a result of forcing countless thousands of professors and millions of students online during the 2020 pandemic, the numbers taking online courses reportedly grew 500 percent literally overnight. While the LMS infrastructure was already in a place, a new tool was quickly added to it, even making inroads into the nearly impenetrable arena of public K-12 education. Zoom, Google Hangouts, GoToMeeting, Big Blue Button and Jitsi teleconference tools suddenly moved from being obscure business tools into the mainstream as OLE delivery mechanisms. At the top of the teleconferencing market sits Zoom, which received immense scrutiny due to a takeover bid by a hedge fund in early 2020.

Zoom adds yet another layer of dataveillance of faculty and students that streams into the already immense ocean of data accessible through Canvas, according to Marachi and Quill (2020). Zoom uses AI to scan the location of the user through the camera and microphone, can turn on and override the host's security settings, can turn on the camera without the consent of the user, tracks users even when the app is turned off, installs a local server on users' devices and is vulnerable to hacking now known as 'Zoombombing' (Ovetz 2022). Among the possible sources of data harvested by Zoom could be measures of bodily motion, eye-tracking and emotion detection (Haw 2019). What has escaped all attention, however, is that like the LMS into which it is integrated, Zoom accumulates data that is now available to administrators and potential employers and can be used for measuring and discipling academic labour power. This connection is explicitly illustrated by Instructure's recent purchase of the integrated app Portfolium which directly provides data on student achievement and competency to employers (Marachi and Quill 2020, 428; Hill 2019).

To make their service valuable to potential employers, Canvas and Zoom accumulate data that is being integrated with data from plagiarism detection apps, learning analytics and outcomes, attendance, social media, credit records and other sources of metadata. This data can be further combined with the growing plethora of student IDs with RFID tags and licence plate readers that can track a student's activity and work outside the classroom or LMS. In short, the granular data generated by a student's movement through every module and task of the online course makes the LMS a rich kernel of data on the effectiveness, efficiency and productivity of a student's work. Rather than demonstrate student learning, the massive data being accumulated about each student is designed to measure their work habits, efficiency, productivity and most importantly their willingness to work. 'New organizations have even suggested that it may be possible to quantify the value of every university module, course or career choice and, by consolidating a permanent record of students' qualifications and skills from across the whole educational 'supply chain' – as 'learner wallets' hosted on blockchain technologies – offer AI-enhanced employability advice and enable students to securely share their data with employers' (Williamson, Bayne and Shay 2020, 355). Such rich data on each individual student is likely to follow a student through their lifetime as a commercially available 'work record score' that will determinately shape their life outcomes. The architecture of OLE is designed to provide an alternative to assessment exclusively controlled by faculty and institutions of higher education, what Wang long ago famously denounced as 'monopolies' subject to legally mandated unbundling (Wang 1975). OLE, the Canvas LMS and Zoom are transforming faculty academic labour into less about teaching than a machine tender for the remote monitoring, measuring, assessing, processing and delivery of disciplined unwaged student labour power.

From Online Education to Gig Work

OLE is central to the strategy to impose a new technical composition of capital in higher education (Ovetz 2020a). The US labour market is rapidly moving to contingent part-time, temporary contract work in which increasing numbers of workers, as much as 30–40 percent of the US labour force, work remotely and are monitored and managed by information technology (*The Economist* 2015). This rapid growth of contingent and platform labour is intended to make the Northern labour force become more like workers in the South where about 84 percent of India's 470 million workers, for example, are 'casual' or self-employed, or contingent (Ness 2015, 85). The adjunctification and rationalisation of academic labour in higher education is not an exception to this new global division of labour, it is actually the model for it.

The short-lived MOOC functioned at the extreme end of OLE allowing tens of thousands of students to select an online class from a higher education 'platform' through which an adjunct professor delivers pre-packaged standardised lessons. Students have no interaction with the professor or one another, and take exams 'assessed' by a computer program in order to earn a 'badge'. Although it has all but disappeared from discussion since its high-profile defeat at San Jose State University in 2013, the MOOC remains the ultimate objective of achieving the professor- and classroom-less 'university' by enclosing all public higher education within an Uber-style platform system for distributing courses in which the content specialist is paid by the head according to surge pricing (Hall 2018, 22–29). Those seeking to rationalise college and university teaching are taking the 'long march' through these institutions by using crises like the 2008 recession and the Covid-19 pandemic to accelerate the move to OLE.

Changes in the organisation, methods, processes and strategies for organising work are intended to decompose the power of academic workers (Ovetz 2020a). Because the labour-intensive teaching and learning that comes from human interaction, social relationships and emotional and intellectual exchange is lacking in the LMS, *teaching* is rapidly becoming deskilled into *assessment*, *measurement* and *monitoring* while *learning* is being replaced by *competency of task completion* (Ovetz 2020a).

This deskilling shows itself in the ever-increasing focus on measuring task completion which becomes a self-fulfilling prophecy that is transforming how we define teaching and learning. According to Ben Williamson, Sian Bayne and Suellen Shay, 'The fact that some aspects of learning are easier to measure than others might result in simplistic, surface level elements taking on a more prominent role in determining what counts as success ... As a result, higher order, extended, and creative thinking may be undermined by processes that favor formulaic adherence to static rubrics' (Young 2020, 5). Learning itself is being redefined and stripped down to the quantifiable completion of tasks.

The reduction of learning and teaching to task completion and task monitoring is intended to produce a larger and more self-disciplined work force.

Trained to work remotely with no apparent oversight, OLE and precarious gig or platform work have evolved into illustrations of the emerging new technical composition of capital. The need for a larger self-disciplined workforce is the outcome of four decades of educational 'reform' going back to the 1983 National Commission on Excellence in Education's *A Nation at Risk* report. While layoffs, class size increases and budget cuts extract more academic labour from faculty, the other objective of reformers has been to produce more 'work ready' college graduates for the labour market. In class terms, it is a strategy to produce more productive academic workers who can work remotely, submit to precarious 'flexible' working conditions and are self-disciplined by the presence of ubiquitous algorithmic surveillance. To achieve this outcome, the primary impediment must be moved out of the way. That impediment is the relatively well-organised faculty who labour in marginally democratic institutions subjected to shared governance and union contracts which provide them with a semblance of autonomy over the content, delivery and assessment of academic work.

Reformers commonly resort to hyperbole about campuses being populated by unruly students, grade inflating faculty and graduates who can't or won't work. Such language underscores the intention of using OLE to automate the disciplining of labour power in the abstract, or what Marxists call 'immaterial labour'. OLE is the strategic response to what Massimo De Angelis and David Harvie call the struggle over measurement. Such tools 'help shape *the form* of academic labour in both educational and research contexts. They do so by counter-posing the measures of capital, which privilege the meeting of abstractly defined targets (whether these indicate financial viability or consistency with government policies), to the immanent measures of immaterial labourers' (De Angelis and Harvie 2009, 20).

The intense struggle still raging over the form and purpose of academic labour is illustrated by the variety of strategies to measure and standardise immaterial academic labour. Among these approaches include faculty and student 'performance indicators' of 'student success': faculty-student ratios; progression rates; matriculation; retention; degree completion; guided pathways; units earned; student, college and departmental learning objectives; and even access and equity reported in periodic programme reviews required by government agencies and accreditation agencies. The imposition of these new measures of learning reflects the shift from the generation and transmission of knowledge to the competent internalisation of information by students. The professor is transformed from expert to foreman, from directing learning and knowledge generation to managing self-disciplined students completing increasingly standardised 'learning objectives' (Prendergast 2017).

The focus of OLE to produce more and better self-disciplined workers mirrors the technical composition of other sectors of the labour market. The logic of the technology that drives OLE is analogous to the logic of contingent labour, the self-disciplining of labour power that is always available for waged work.

As the proportion of the labour force that are contingent – contract, consultants, gig and platform workers – grows, higher education is being reorganised to produce the labour power to do that work. This emerging division of labour in higher education serves the emerging global division of labour across the spectrum from ‘ride sharing’ to the work of legal document review. Big Data is being used to rationalise every type of job from the unskilled to the professional, fragment it into its component parts, automate some of the parts and distribute the rest either horizontally to other deskilled workers, or situate them under the control of management. More of the work is distributed to informal ‘gig’ workers who are considered ‘self-employed’ because they are intentionally hired lacking any formal legal contractual relationship with the employer of fact. In an updating of the ‘putting out’ system described in detail by Marx (1867), these workers work remotely carrying out discrete tasks, lack immediately overt oversight by human managers, must possess the self-discipline to always be ready to work and are entirely responsible for ensuring their own reproduction and tools whether they have paid work or not. In his study of class struggle in platform food delivery work, Cant (2019) calls this new technical composition algorithmic management by the ‘black box’. The new division of academic labour is designed to serve the global division of labour in which workers of all types – including professors – labour under the conditions of gig work.

Disrupting the Academic Black Box

Academic resistance to these ‘reforms’ now being pushed by the ‘edtech’ complex of corporations, administrators, thinktanks and government planners, has been primarily levelled at external factors and through emphasising the impact on loss of ‘quality’, declining ‘outcomes’ and high cost while almost entirely missing the primary attack on academic labour.⁴ The implications of the rationalisation of faculty academic labour has been apparent since Troutt first pitched the professor-less classroom more than four decades ago in which ‘an unbundled system assumes learning can transpire without students having to purchase the teaching function’ (Troutt 1979, 255). Today, it is common to read about the ‘automation of the profession’ in which AI is paired with an entirely precarious faculty of ‘machine tenders’ delivering ‘digitally mediated rebundled teaching’ (Czerniewicz 2018). OLE is transforming teaching to be ‘focused more on coaching and mentoring and less on content delivery’ (Sandeem 2014, 5). The professor-less virtual classroom is attractive to universities that wish to be ‘swapping expensive lecturers for cheap, versatile machines that don’t go on strike, don’t need sleep, and respond to students within nanoseconds’ (Haw 2019). As a result, higher education faculty and unions have not yet grasped the full extent of these objectives for expanding OLE. What is missing in faculty union organising and resistance is that edtech advocates are not merely proposing

to outsource teaching merely to make profits but to reorganise all of higher education to better subordinate it to global capital accumulation.

The first step to achieving this is to break the control of academic workers over teaching and learning. As Mazoué bluntly puts it, 'If we assume learning is dependent on teaching, and that teaching is an inherently labor-intensive activity, then we will never be able to increase productivity, improve quality, and lower cost simultaneously' (Mazoué 2012, 80). As long as faculty control teaching and assessment of learning, faculty labour is a critical choke point for disrupting the reorganisation of higher education.

LMS driven online education is only the latest 'reform' effort which is intended to rationalise and measure academic labour (Noble 2003). The outcome of a university education is not preordained because the struggle over measurement is a continuation of the struggle over the uses of academic labour. As De Angelis and Harvie remind us, 'capital's constant struggle to impose and reimpose the 'law of value' is always a simultaneous struggle to impose (a single, universal) measure' (De Angelis and Harvie 2009, 27). As the anonymous academics writing as the aptly named The Analogue University put it, 'we need to do more than merely reveal the darker side of these transformative neoliberal relations; we need to find ways to mobilise and actively resist them' (The Analogue University 2019, 1186).

Academic worker organising must take into account this new algorithmic composition of academic capital in order to develop new tactics and strategies to counter it. After three years of higher education nearly all going online, academic workers need to roll back any effort to shift the baseline and stop further deskilling of academic labour. Such organisation must begin with tactical rigidity and the application of leverage at critical choke points up and down the labour supply chain (Bonacich 2003; Alimahomed-Wilson and Ness 2018). Academic workers already possess power over both the operations of the university and the production of disciplined labour for capital. It is yet to be seen if it will be used.

Notes

- ¹ One of the most significant pushes for moving and keeping higher education online is being made by the Boston Consulting Group whose Managing Director and Partner Nithya Vaduganathan has touted her efforts to 'develop strategic plans for scaling personalised learning' (code for online education) and 'supported rebuilding the K-12 system in New Orleans following Hurricane Katrina.' (BCG 2020) In fact, the massive shift to Zoom during the pandemic is modeled after the Sloan Semester online courses for Hurricane Katrina and Rita refugees organised by the Sloan-C project to expand OLE (Online Learning Consortium 2020). Due to disruption of the

education of about 1.6 billion students in 200 countries because of the pandemic, the edtech industry is expected to reap windfall profits estimated to double to \$341 billion in total value, with online degree providers doubling in size to \$74 billion by 2025 (*Business Insider* 2019; Holon IQ 2020; Hogan and Williamson 2020, 4).

² Marx examined the technical composition of capital in detail in chapter 25 of *Capital* Volume I (1867, 762–870). The technical composition of capital has gained a resurgence in recent years. It can be understood as the current ratio of technology to human labour and the strategy, rules and processes for organising work and managing workers (Woodcock 2016; Cleaver 2019; Ovetz 2020b).

³ I focus on Canvas as the dominant LMS in the education market at this time.

⁴ The potential profits from the \$600 billion higher education sector is so immense that investments by the 2,861 ‘edtech’ companies then in existence grew 32 percent between 2011–15. Edtech investment in higher education was thirty percent of the total, just behind K-12. Ninety-seven percent of all investment was concentrated in just five countries, with 77 percent of that in the US with Canada, the UK, India and China composing the rest (BCG 2016).

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