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Moving beyond Microwork: Rebundling Digital Education and Reterritorialising Digital Labour

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Keywords

Microwork; digital labour; digital education; critical pedagogy; higher education

Abstract

Digital labour is often reduced to microwork, granular tasks disassociated from a larger work project, and the labour market to serve these activities is distributed and largely unorganized as a collective body. Larger platform employers such as Amazon Mechanical Turk and Samasource have mobilised large pools of labour towards microtasks which, often, aggregate into a larger work process made opaque to the labour used to complete them. Some link this micowork to poverty alleviation suggesting the public good that might arise from such a workplace and larger industry reconfiguration. Yet, an important feature of microwork is a general placelessness that subverts labour and the communities from which this labour emerges.

Education has largely aligned itself with this efficiency and microwork maxims in moves towards granular capacities that are both restrictive and empowering. In these contexts education is reduced to serving the granularization in work that automation and microwork has accelerated. Yet, there is a role for an education that embraces the 'messy' configurations of digital labour, one that provides a futures dimension and a critical capacity for redefining the futures of work. This chapter explores this microwork contexts and suggests several educational reconfigurations that might serve this critical capacity.

Automation, Microwork, and Urban Centres of Capital

Technological unemployment brought upon by large scale automation and the datafication of society that largely preceded it is both juxtaposed against, and partially stimulating, the increasing demand for higher education worldwide. This is occurring precisely amidst a growing trend of nations to walk back commitments to core social contracts, such as equitable and affordable access to higher education.

Largely seen as most readily affecting low-wage and low-skill employment, research suggests that the effects of automation will be largely felt throughout most sectors. The effect of big data, artificial intelligence (AI), and automation on work will largely be directed at particular activities rather than entire professions. "Certain activities are more likely to be automated, requiring entire business processes to be transformed, and jobs performed by people to be redefined" (Chu et al, 2017). The suggestion that AI will lead to wholesale automation of entire occupations, particularly those in low-

skilled professions, is probable; however, percentages of activities within all professions, across all sectors, are likely to be automated. Amongst OECD nations, 57% of all jobs are at risk of being replaced by automation (World Bank 2016). The *probability* of automation across entire professions and *certainty* of automation in certain tasks across all professions poses significant challenges for future employment. When automation is left impractical, labour is often unbundled to disaggregated discrete tasks, and the labour market to service these discrete activities is distributed and largely unorganized as a collective body. The subject of this chapter, microwork, typifies this unbundling.

Microwork of the sort described in this chapter exists largely in the gaps within these shifts, itself partially a product of the unbundling of employment and the higher education that has traditionally stimulated capacity to obtain that employment. Microwork refers to small digital tasks that people can perform anywhere to supplement or provide income; completed tasks are compensated in small amounts and barriers to entry are lower than in online freelancing (Ross et al 2010). It is largely low-skilled repetitive or task-based work, a sector perhaps best typified by the platforms that have been designed to service it, such as Amazon's Mechanical Turk. Microwork is distinct from high-skilled consultancy or creative task based work, digitalwork consistent with the gig or freelance economies and best typified by platforms such as Upwork or Fiverr. Both are directed at unbundled and discrete tasks within a larger body of work. Processes of work within a work project which would have been performed traditionally within one organisation body are now disaggregated, distributed, and reconstituted through data-driven decision making processes or even artificial intelligence.

Higher education potentially presents capacity for these difficult to automate skills, a point that is returned to later in this chapter as a possible response to these shifts in employment. Yet despite the advantages posed by these urban collectives of intellectual and financial capital in response to automation, advantages that are unequally distributed globally, the unbundling of work into microwork, regardless of the level of skill or education required to obtain that microwork, shows no signs of abating.

As such, microwork and all its attendant precarity forms the focus of this chapter. Microwork platforms will be presented and critiqued, as will the rhetoric regarding their promise in servicing underrepresented populations, a promise that has remain largely unfulfilled. A brief discussion follows on the impact of this unbundling of work into microwork on the unbundling of local communities, or the placelessness (Lehdonvirta, 2016) that potentially subverts or places significant pressure on geographical communities. Higher education, largely unbundling itself and in an increasingly diverse educational marketplace, is presented as a critical response to the unbundling of labour made manifest in microwork. Digital education is presented as its attendant method. Ultimately, however, this chapter suggests microwork is a precarious opportunity emerging as a result of the unbundling of labour, one that has proven deceptively difficult to automate in the immediate present. As such, this chapter asks what role higher education has in providing critical capacity for understanding microwork and how a critical pedagogy might begin that process.

(Un)realised Potential and Platforms of Microwork

Largely emerging from the rise of crowdsourcing in the 2000s, microwork refers to small digital tasks that people can perform anywhere to supplement their income. Largely due to the ubiquity of mobile technology, microwork was seen as a potential offset to increasing levels of youth unemployment (Mtsweni and Burge 2014), particularly in emerging economies where low levels of access to more sophisticated forms of ICT (computers, smartphones, programmes and software, reliable internet access) disadvantage many. Further, microwork platforms were seen, and still are largely seen, as boons to small and medium enterprises (SMEs) where access to specialised skills had proven difficult through traditional recruitment platforms or methods (2014).

Within emerging economies, microwork has proven modestly popular in South Asia and sub-Saharan Africa. South Africa has had modest uptake (Chuene and Mtsweni 2015). There is evidence to suggest the role that cyber cafes might play in broader adoption of microwork in Kenya and India

(Gawade et al 2012). In Sri Lanka, survey data suggested how microwork services those looking for supplemental income, rather than as primary income due to income uncertainty and a general cultural preference for "working in an office" (Galpaya et al 2018). Analysis of microwork opportunities in Nepal has shown the same propensity to expressing microwork value in terms of flexibility, particularly for university students to offset tuition fees (Pradhan 2017).

Barriers to participation, particularly for those from emerging economies, are significant. Beyond having the prerequisite skills to perform the tasks presented in microwork, and the soft skills necessary to obtain this work and develop an online reputation suggesting both capability and trustworthiness, exploitation of microworkers is a pressing issue (Mtsweni and Burge 2014) as are the erosion of fair labour practices due to the precarity of the labour being advanced (Webster 2016). Payment exchanges are often problematic in emerging economies, particularly as many microwork platforms pay through inaccessible applications such as PayPal (Galpaya et al 2018); channelling secure payments to microworkers via a micropayment gateway that could accommodate a range of payment methods (e.g. M-PESA, e-wallets, PayPal, airtime) is critical for participation from emerging economies but rarely possible on microwork platforms.

Yet beyond these barriers, the adoption of microwork in emerging economies is further affected by gender and cultural practices associated with online work. Bidding for microwork might not be as readily accepted or understood due to its competitive structure (Mtsweni and Burge 2014). Women are less likely to participate in microwork at least partially due to the gender digital divide that limits meaningful access and use to the minimum technology required to participate, namely mobile phones, and a lack of conceptualization of the potential benefits that access and use provides (Bailur et al 2018). Gender and ethnicity-based discrimination based on matching frictions, hiring inefficiencies, algorithmic and cognitive biases occur and a lack of legal protection limits worker response (Codagnone et al 2016).

Some research has suggested that for women microwork is more compatible with some countries' cultural and social norms than traditional employment (Kuek et al 2015). However, these potential advantages are mitigated by lower levels of ICT access and use for women in sub-Saharan Africa and South Asia (GSMA, 2018). As such, participation in microwork, with a few notable exceptions, largely advantages those from established economies, existing coordinated labour markets, and with consistent ICT access.

Platforms and purpose

Larger microwork platforms such as Amazon Mechanical Turk and Samasource have mobilised large pools of labour towards microtasks which often aggregate into a larger work process made opaque to the labour used to complete them, a situation that lends itself to the placelessness described further in this chapter. However, not all microwork platforms are established with the same intent nor the same veneer of justice and equity in access and use. As such, this section briefly discusses representative examples of microwork platforms and is not meant to be comprehensive.

Highly visible examples largely consistent with highly skilled gig or freelance economies are omitted (namely Upwork, critiqued in Green 2018) and effort is made to provide examples of platforms that service, or allow participation from, emerging economies. This condition creates some inherent tension with the structure of the chapter: large pools of highly skilled labour are found in emerging economies and they are actively participating in gig and freelance platforms. A study in 2014 found that 85% of microworkers on ODesk (the precursor to Upwork) are located in seven countries: India, the Philippines, Bangladesh, Pakistan, Russia, Ukraine, and the United States; a condition that belies the fact that "despite the potential for almost anyone with an Internet connection to become a microworker, we can see that microwork practices have very clustered geographies" (Graham 2014).

These clustered geographies remain, but more importantly for the purposes of selection for this chapter are the clustered geographies of sophisticated skills needed to participate in these gig platforms, clusters that speak to the accumulated advantage emerging from those with greater access to education, technology, and gainful employment (Fabo et al 2017). This accumulated advantage is reinforced by Upwork itself and the Q1 2018 skills they identified as being most relevant to the freelance economy, skills largely inaccessible for those from emerging economies and/or those with less financial or education mobility: blockchain, computer vision, chatbot development, augmented reality, and more (Upwork 2018). As such, this chapter focuses largely on platforms that allow for participation from emerging economies and workers other than highly skilled, a focus that underpins the distinction between microwork and freelance or gig work as described earlier.

Amazon Mechanical Turk perhaps typifies microwork platforms, particularly those that facilitate the execution of highly granular and often repetitive tasks. The complexity of the tasks varies from algorithm writing to the labeling of photos or videos, providing descriptive text for product listings, or transcribing scanned documents, tasks which are referred to as Human Intelligent Tasks (HITs). It has been critiqued extensively in the research as well, particularly in its effect on the commodification, and subsequent unbundling of labour, and its erosion of workers rights and related legal frameworks protecting such rights: "Amazon declines all responsibility related to the transactions between requesters and workers in terms of quality, safety or payment issues, and stipulate: 'you use the site at your own risk'" (Bergvall-Kåreborn and Howcroft 2014). Further are the aforementioned payment mechanisms which discourage participation from emerging economies (discussed in Galpaya et al 2018).

Rather than acting, or appearing to act, solely as a marketplace of microtasking with little to no protection or philanthropic function, some microwork platforms ascribe to impact sourcing, which refers to how relevant industry employs people at the base of the pyramid as workers, generally through digital microwork (Carmel et al 2014). Typifying this approach, Samasource is a non-profit organization that brokers such microwork specifically as a poverty alleviation mechanism. As with Amazon Mechanical Turk, it focuses on online content moderation, digital transcription, and data gathering and promotion. Largely based in Kenya and India and drawing on labour pools from these areas, Samasource advances the tagline of "enrich your data and fight poverty", suggesting the public good that might arise from such a workplace and larger industry reconfiguration. Samasource secures contracts from large organisations, divides these contracts into microwork opportunities and distributes them to trained workers through Samasource's own computer centres (Olsen and Carmel 2013). Cloudfactory (2018) follows much this same structure through impact sourcing, creating a system which allows organizations to create their own virtual assembly lines for digital production; the workforce is largely situated in Nepal and Kenya and is, loftily, tied together through mission: "a mission to connect one million people in the developing world to digital-age work, while raising them up as leaders to address poverty in their own communities."

A mobile based example capitalising on this same philanthropic bent is JANA (2018), which largely exists as a data collection service. Surveys answered via text message are rewarded with phone credit, a further dissociation of work and salary or wage-based compensation. Further variations of microwork services include LiveOps (2018), a cloud call centre services comprised of microworkers working from home, and used to support rescue and recovery efforts during Hurricane Katrina (Scholz 2017). Tasko (2018) is a microwork platform that purports to presents microwork as games, however implausible taglines like "really fun tasks that look like games" presents that structure. Many such examples exist.

Whether as an extension of philanthropic function or owing to their role as outsource provider (in contrast to Amazon Mechanical Turk's role merely as matchmaker), both Samasource and Cloudfactory have invested in worker training, an investment that suggests the role that higher education might play in this unbundled environment. Both Samasource and Cloudfactory invest in worker training directed at skills development, job search coaching, digital literacy, and broaching connections with employers (Samasource 2018). Largely upskilling workers for participation in the

markets their own microwork platforms are creating, this training, while laudable in terms of some investment in professional development, is incomplete if designed to raise workers "up as leaders to address poverty in their own communities."

Ultimately, microwork, like many intersectional technologies, poses both advantage and disadvantage: "the very same technology, used in very similar organizational conditions (e.g. distant, virtual work), can provide very different internal and external outcomes depending on how and when in the innovation process ethics-related variables are taken into account" (Brusoni and Vaccaro 2017). For Samasource and others involved in impact outsourcing, this ethical variable is positioned structurally as a core organisational and operational value; it subsequently structures all organisational activities emerging from it. For others, the ethics of microwork represents, largely, an operational nuisance, a nuisance expressed in a general disregard for precarity, living wages, labour practices, worker training and safety. This chapter, particularly in its discussion of educational responses to microwork, will focus squarely on developing capacity for ethical and sustainable digital labour futures.

Educational microwork

Yet, that educational response will emerge from a sector unbundling itself. Unbundling, particularly in the higher education context, refers to the disaggregation into its component parts. For example, the separation of teaching from research; the outsourcing of student support and assessment; the breaking down of academic work into para-academic service roles; and the outsourcing of teaching via adjuncts (Gallagher and Bayne 2018). Criticism of unbundling focuses on its reduction of higher education to a service industry for employers and its colonisation by the values of Silicon Valley, the progenitor of many of these microwork platforms.

Typifying this unbundling are microwork platforms aimed at teaching, such as Teachmenow (2018), a platform service offering access to a pool of distributed teachers across a range of disciplines at tutorial price points dictated by the teacher, a matchmaking model mirroring Amazon Mechanical Turk. Notably teachers on this platform are referred to as "experts", foregrounding subject matter expertise potentially at the expense of pedagogical capacity or innovation. Mirroring the philanthropic bent of Samasource, Chatterbox (2018) is a language learning microwork platform directed at employment for refugees, matching refugee language teaching capacity with demand for their language skills. Chatterbox provides training to this effect for refugees to become workers on their platform.

Many of the unbundled educational responses to microwork are predictably designed to foster success in the microwork platforms themselves, a reduction of education to a service industry for employers (Gallagher and Bayne 2018). One such example is the Digital Workforce Development Initiative (DWDI 2018), a coalition comprised of a micrork platform (Fiverr), an unbundled educational service provider (Udemy) and an educational initiative emerging directly from a microwork platform (Samaschool). It is designed to focus on "specialized independent work", highly skilled microwork or work consistent with the gig economy. DWDI emerges largely from previous efforts at training workers for success in these microwork platforms, such as Samaschool, a US based training programme designed ostensibly "to give low-income community college students digital skills with which they can earn a living" largely through the same microwork platforms which have proven successful enough to fund the development of such education.

Indeed, much of the way in which lifelong learning is rhetorically positioned as an offset to this unbundling of labour and the subsequent need to reskill at various stages of a worker's life are, at least partially, responses to microwork platforms and the platform capitalism (Srnicek 2017) from which they emerge. Lifelong learning is critiqued as a neoliberal model designed to educate flexible subjects for the corporate job market (Regmi 2015); unbundled educational provisions offered through platform education of the ilk typified by Coursera, Udemy, and edX reflect this. New accreditation mechanisms, stackable degrees, certificates, badges, personalised pathways and self-

paced study all provide flexibility for the student and a pliability to the unbundled workplace of microwork.

Digital education as a bundled response to microwork

Education has largely aligned itself with these efficiency and microwork maxims in moves towards granular capacities that are largely reductionist derivatives of computational thinking (Azhar 2016) with some measure of pastoral support. The fragmented nature of digital work itself suggests an increased need for education that provides the attendant skills associated with task decomposition, microtask sourcing, completion, "micromoments" (moments of labour in small gaps in time largely via mobile), all the skills associated with "microproductivity" (Teevan 2016) and success on microwork platforms. We descend educationally further into granularity.

Beyond microwork and the attendant educational responses to it presented in this chapter is the reconfiguration of education as "relational networks of institutions, practices, technologies, money, and marketing, which together function as paradigmatic models of the future of public schooling" (Williamson 2018). Some of these initiatives- AltSchool, Summit Public Schools, Khan Lab School, and XQ Super School Project- can be seen as more formalised examples of the types of microwork educational initiatives discussed in this chapter, namely DWDI, as well as broader educational platforms such as Coursera et al. There is largely an attempt to recreate the computation practices at work in the technology sector and repurpose them into pedagogical employ. Microwork and its attendant educational efforts exist as reductive offshoots of this larger reconfiguration of education; they are tasked largely with preparing workers for their own digital platforms.

As such, there is a paradox in the response suggested in this paper, one of *digital* education. This is a response largely co-opted by these 'relational networks,' existing as it does amidst the confluence of technology, institutions, and evolving regulatory policy. How can digital education function amidst an environment of technological co-option, datafication, unbundling, and reduction? The author concludes that the answer to this question is largely predicated on the futures orientation of such education and the 'messy' responses such uncertainty therein. There is a role for an education that embraces the 'messy' configurations of this futures orientation in response to the increased unbundling of labour and education, potentially one that provides a critical capacity for redefining work itself. An education that largely moves beyond the micro and towards intersectionality will have, at least partly, a digital component, a component that makes possible complex and largely ephemeral intersections of research, teaching, data, institutions, and geographies.

This section begins to advance several thematic bundles that might serve this messy reconfiguration of education and acts as a brief summary of a possible educational response to the changing face of work in the face of technological unemployment.

Selective bundling of higher education in an age of unbundling

Unbundling refers to the disaggregation of higher education into its component parts (for example the separation of teaching from research; the outsourcing of student support and assessment; the breaking down of academic workinto para-academic service roles and so on). As the expansion of higher education drives up the cost for governments and individuals, proponents of unbundling see in it a positive disruption which will make higher education more market-driven and ultimately more affordable, with a greater focus on employability and flexibility (Gallagher and Bayne 2018). Yet this focus on employability and flexibility places higher education in an increasingly competitive educational marketplace, as many of the educational initiatives discussed in this chapter suggest.

The unbundling of higher education has presented considerable challenges for the sector, particularly in the continued erosion of the idea of higher education as a public good, but is also more pragmatically felt in direct provision: the perceived lowering of teaching standards, indeed in some instances the automation of the teaching function, however problematic (Nokelainen et al 2018); the

uncoupling of teaching and research stunting the feedback loop between the two; and more. This unbundling ultimately advances an educational value proposition that largely fails to account for the broader student experience: personalisation, multiple learning pathways, and a largely a la carte educational marketplace services a proportion of the population equipped to navigate its largely unstructured terrain, largely through the lens of existing participation in the labour market. This is a paradigm that largely disadvantages those without prior engagement in the digital labour market: younger students, those entering the workforce for the first time, the elderly, and so forth.

Research suggests the bundling of educational programmes along with value-driven provisions of pastoral care presents significant benefits for students (Scrivener et al 2015). This is a bundling largely unaccounted for in the increasingly competitive educational marketplace and one that represents opportunity for the reinvigoration of higher education; "universities need to be re-centered on the distinctive kinds of learning that they alone can foster: high-impact forms of mentored, inquiry-based learning" (Bass and Enyon 2017). This bundled approach to programme development, a mix of mentored research-led education and pastoral support, represents a potential reconfiguration, or reaffirmation, for higher education in the face of labour fragmentation.

The potential reconfigurations presented in subsequent sections are largely further pieces of a larger bundling effort, an effort that "requires deep and sustained attention to the nature and purpose of the institution, and society-wide deliberation on the values that should orient it" (McCowan 2017).

Reterritorializing: redefining community and new proximities

A further element of a larger rebundling of education, one particularly attentive to the impact of microwork and platform capitalism on spatial constructs, is the need for a reterritorialising of space. A critical feature of microwork is the general placelessness that it engenders (Lehdonvirta, 2016), a placelessness that potentially subverts or places significant pressure on material, geographical communities. The placelessness of digital work has been produced through "the digitisation of information, the codification of knowledge, the modularisation of business functions or the standardisation of tasks" (Flecker and Schönauer 2016). Indeed, this distortion of place in microwork is conflicted even in the digital territories in which this work is performed: "organisational mechanisms that underpin online work platforms paradoxically both deterritorialise and territorialise online work and encompass new processes of disintermediation and intermediation" (Ettlinger 2017). The territory of digital work is territorialised as is the geographical space from which workers engage with it.

Temporally, microwork uncouples the local time zones in which workers operate and the time zones in which the work is largely directed towards, leading largely to a reversal of awake life, and a reconfiguration of social engagement with local actors and circles (Scholz 2017). This uncoupling of time is often explicit, for instance in the "masking of location during a call, where call centre workers are required to hide their geographical location" (Ibrahim 2012). This placelessness is in some ways intentional: it is designed to exploit geographical differences in skills and labour costs, as well as compressing time and space inefficiencies in production cycles (Lehdonvirta, 2016). Much of the neglect of national level labour practices and regulations perhaps best typified by Amazon Mechanical Turk's matchmaker approach is made possible largely by exploiting geographical differences in skills and labour costs; the platform capitalism made possible therein largely evades regulation, further mitigating the influence of the geographical on the digital.

Mobility exists within these new territories but is contested as "humans cross borders far less easily" (Braidotti, 2013) than the digital work that they perform. Mobility, largely seen as emancipatory, becomes in this context of microwork a distortion of place, suggesting a need for a cartographic reading of microwork, a "theoretically based and politically informed reading of the present" which identifies power structures as "restrictive (*potestas*) but also empowering or affirmative (*potentia*)" (2013). A critical reading of microwork as *potestas* and *potentia* poses some opportunity for digital education at higher education and may contribute to a larger bundling effort;

further, it may provide a critical foundation on which to reaffirm place in the geographical context, not to position the regional and the bounded as 'problematic and parochial' (Edwards et al 2011) but rather empowering.

Pragmatically, mobility conveniently lends itself to digital education that reterritorialises local responses to microwork and platform capitalism, namely in reinvigorating the mobilisation of labour and labour practices eroded by digital work.

Digital labour: sites of resistance and mobilisation

Digital education can rebundle higher education in response to microwork in part through the mobilisation of labour and attendant labour practices. ICTs have a long history of being used used to construct 'sites of resistance' who might otherwise be excluded from organising through conventional means (Ho et al 2002). Platforms performing select roles consistent with labour mobilisation efforts are emerging, largely designed to promote corporate governance and capacity building; QuizRR (2018), and LaborVoices (2018) typify these platforms which are largely designed to build communication channels between actors along the global supply chain (Arora and Thompson 2018). Further examples exist, largely ad-hoc, of mobilisation of workers through some form of ICT, yet these are largely responses to regional work rather than dispersed microwork. Although new communication tools might increase awareness of digital exploitation or digital labour rights (2018), there is little indication that this increased awareness will translate into increased labour protections.

Yet this potential, largely unrealised, represents a further opportunity for bundling for higher education, an opportunity that echoes Lehdonvirta (2016) question: "to what extent, then, can dispersed informational labourers make use of ICTs to re-establish links, develop shared identities, and mobilize for collective action?" With microwork, this is a difficult mobilisation largely due to the "borderless" nature of these platforms operating outside the purview of democratic oversight (Urry, 2014), and the need for the spatial topology of the digital territory to align with the "contours of the market it is intended to influence" (Lehdonvirta 2016).

Higher education through the conduit of digital education can provide a bundled response comprised again of "high-impact forms of mentored, inquiry-based learning" coupled with measures of pastoral care (Bass and Enyon 2017). This response can provide a supporting infrastructure that advances a digital labour platform that works towards the pillars advanced by Bergvall-Kåreborn and Howcroft (2014): a minimum wage with limits to the maximum number of hours worked per day; minimal forms of social protection and health insurance; some forms of health-safety measures; data protection standards for workers; and algorithmic accountability (ensuring that matching algorithms and reputational ratings are first transparent and second do not discriminate with respect to gender, ethnicity, race, and age). There is an emerging precedent for this approach, discussed in Schneider in this very book: rather than direct students to these investor-owned microwork platforms to expose them to the contours of the gig economy, community colleges in California opted instead to collaborate with cooperative platforms where workers are co-owners (Schneider 2018); higher education can and should follow suit, explicitly modeling this significant bundle of a larger bundling effort through its choice of a platform that makes possible the pillars advanced by Bergvall-Kåreborn and Howcroft (2014).

Higher education can provide the intersectionality needed to engender this learning around digital labour by drawing on disciplinary expertise (itself bundled into new multidisciplinary approaches), providing scaffolded simulations and learning opportunities; cultivating critical and reflective practice; providing digital sanctuary and data protection for all its students and dedicated digital space for mobilising; and appropriate measures of legal counsel.

Identities and (re)professionalising

The deprofessionalisation of professions responsive to digital work is largely underway; from journalism to education. In education, the unbundling of entire sectors has led to select aspects of

the teaching function being automated or reductionally proscribed in scripted curricula; to data-driven systems of accountability and evaluation largely outside the control of the individual teacher or school; to the increasingly competitive accreditation market made possible by a general loosening of the control that higher education had enjoyed over these functions. In journalism, the move to digital has led to the same placelessness described in Lehdonvirta's (2016), a decoupling of news outlets and the locality from which they emerged; and with the subsequent deprofessionalising of the sector as a whole. Social media, blogs, and more all contend with venerated news outlets.

Microwork accelerates this deprofessionalising for a number of professions simultaneously, largely as a result of this detachment from the locality in which it is performed and its territorialising in another digital space: as discussed, the microwork platforms exist as territories unto themselves devoid, largely of legal frameworks of protection for the workers who inhabit them. Microwork platforms extend this reorganisation by repositioning digital workers within existing cultures of new media work (Irani 2015) and their employers as potentially technologists and innovators engaged in peer production (Shirky 2010 via Irani 2015); interactions between these actors and the larger cultures in which they inhabit are ported through a cultural lens of interface and systems design (Chun 2011) which can obscure "workers behind code and spreadsheets" (Irani 2015). Distinctions are made between "Innovative" laborers and "menial" laborers, ameliorating resulting tensions in new media production cultures in turn" (Irani 2015). For every Upwork innovation sits an Amazon Mechanical Turk menial task. Identities as professionals are made opaque, reterritorialised, or obliterated as a result.

These reorganisations and their impact on the professional identities of microworkers represent the cultural work of microwork platforms that needs to be attended to in any digital education response. Along with labour mobilisation comes a critical pedagogy designed to expose the obfuscated cultural work of microwork and to professionalise both the professions largely torn asunder by shifts to digital employment, but also those operating in the new labour landscapes that microwork platforms contribute to the production of. This is challenging insofar as with microwork "there are no titles, recognizable supervisors or even colleagues, as interactions necessary for the completion of a task are anonymized and mediated by algorithms" (Lehdonvirta and Mezier, 2013); however, by surfacing the cultural work of microwork, by drawing critical attention to the obfuscations of professional identity presented in algorithmic mobilities through microwork platforms, and by exploring critical responses to this opaqueness, higher education can couple their digital education efforts suggested in the previous section on labour mobilisation and resistance with a sustained and nuanced educational capacity for professionalising, and in some instances reprofessionalising, digital labour landscapes.

Appropriate and enriching uses of and education around data

Partly as a pragmatic precursor to engendering a critical perspective around the role of data in digital platforms of work, and partly as a means of critical education around the uses of data, particularly in algorithmic ranking and selection of microworkers, a further bundling of higher education is a robust engagement with the data practices of digital labour. This is again a part of a larger unbundling effort, one presented alongside a critical education around labour mobilisation and resistance, territorialisation and placelessness, and the professionalisation and deprofessionalisation of work on digital labour platforms.

An educational response would provide two complementary strands of activity: critical exploration of how data is being used on individuals; and either a critical capacity for emancipation from that process, or agency therein. For both, pedagogical models exist that would prove pertinent: critical analysis of a specific data driven reality such as the data practices of microwork; questioning of hegemonic concepts behind the data and the mechanism driving its generation; and development of new knowledge structures around that critical data education, as well as new data generation practices (Tygel and Kirsch 2015) that sustain agency within or emancipation from the obfuscations of digital labour platforms.

Futures education

Within this bundling effort sits a futures education designed to provide predictive capacity for both the student and the university, particularly as it applies to digital labour and a critical understanding of the microwork platforms where an increasing amount of work is being performed. This is largely a culmination of the educational strands presented thus far: bundling of education and pastoral support; the placelessness and reterritorialization of digital space; the mobilisation of digital labour within these territories; the professional identities being shaped therein; and critical capacity exploring how labour is being shaped by data. Futures education provides an opportunity to explore how this bundling of education can contribute to a predictive agency for both the student and the university.

Futures thinking is increasingly an accepted practice within higher education for creating, largely design-based, speculative responses to change that is co-developed across communities largely in response to exploring how "digital shifts are re-shaping education" (Bayne 2018). There are many such projects: Stanford 2025 (2014) was an attempt to design the future of the undergraduate student experience; Near Future Teaching at the University of Edinburgh (2018) is designed to co-design the future of digital education; the London School of Economics and University of the Arts London Future Happens project (Future Happens 2017), a community driven exercise to frame the discussions and debates away from technology in and of itself and towards innovative and iterating, largely future oriented digital practices; Georgetown University's Designing the Future project (2017) was a curricular future design exercise that focused largely on an alignment between institutional values and future curricular orientation. Many such futures projects exist in higher education, all exploring strands of a larger institutional role: education, curriculum, experience, and more.

A digital education effort in response to the machinations of digital labour might glean aspects of these futures approaches largely through an adoption of methodology, the challenging of binaries and assumptions inherent in a critical education, and the co-creation of critical and value-driven responses to that future. There is a need in this futures education to resist the perceived inevitability of the erosion of labour practices, protections, and professional identities, largely amplified by neoliberal transformation of public sector institutions and a reduction of education to skills development (Singh 2015). This perception needs to be challenged if futures work is to meaningfully explore the relationships between possible labour futures in what they can or could be, what they are likely to be, and what they ought to be.

A further strand of futures education would challenge the assumption that the future is either technologically deterministic or exclusively human. Current advancements in systems thinking and theory reposition the primacy of the human actor in this future. This is evident in posthuman critiques of education where the student is repositioned not as a "transcendent observer of the world" nor education as a means of "production of a certain kind of humanist subject" (Bayne and Jandrić 2017); these critiques provide utility for the futures education suggested in this chapter in its capacity to map larger systems of activity in which individuals have some, but not absolute, measures of agency, such as is the case with microwork. Technology plays a role in social change but not in isolation or as an inevitability; social change is "a co-production of technical, discursive and social factors" (Facer and Sandford 2010) and a critical education will expose those factors as it applies to the changing face of digital labour.

Again, this futures education is designed to largely be emancipatory or agency inducing. Futures education in higher education should aim to largely to empower "individuals and groups to make decisions about possible future paths rather than simply coerce them towards certain predetermined actions" (2010). A focus on futures "as an active object of desire propels us forth and motivates us to be active in the here and now of a continuous present that calls for resistance. The yearning for sustainable futures can construct a livable present. This is not a leap of faith, but an active transposition, a transformation at the in-depth level" (Braidotti 2013). The digital education

proposed in this chapter as a response to microwork and the larger digital platforms that structure increasing amounts of labour is designed to be systematically transformative, a transformation that will, incrementally, produce a more livable present and sustainable labour future.

Conclusion

As outlined in this chapter, the significant shifts in labour practice engendered by increasing shifts to microwork platforms has generated significant, and often unwelcome, mobility: the unbundling of higher education and other sectors, the placelessness of digital work unmoored from local communities, the disintegration of legal protection that occurred as a result of this placelessness, the deprofessionalisation that has occurred as a result of the parsing of larger work processes into disconnected tasks, and the role of data-driven management practices and artificial intelligence in cohering this disconnect for employers.

Education has or is increasingly aligning itself with these movements and the granular realities of microwork platforms in moves towards granular capacities that are largely reductionist offshoots of computational thinking (Azhar 2016); a few such educational initiatives, often explicitly aligned with the very microwork platforms they are educating workers to support, are discussed in this chapter. The skills necessary to complete tasks and the pastoral support needed to function in these microwork platforms are emphasised as education is reduced to a service industry for employers; education is reduced to serving the granularization in work that automation and microwork has accelerated.

Yet, there is a role for an education that embraces the 'messy' configurations of a futures orientation, one that provides a critical capacity for understanding digital labour, the data decisions that drive professional identities, and the places emerging within these platforms. Building from critical capacity is a need to bundle higher education through this critical capacity, to provide critical capacity for understanding the territories of digital labour and how they are unmoored from local communities, how the mobilisation of digital labour might occur in these new territories, and the new or reaffirmed professional identities that might emerge as a result. A new bundling of education is necessary in order to secure an affirmative hold over digital labour, a "theoretically based and politically informed reading of the present" which identifies power structures as "restrictive (potestas) but also empowering or affirmative (potentia)" (Braidotti 2013), and to unfold that affirmative into the future through a critical digital education, one that affirmatively reterritorialises the very digital space that much of this labour will be practiced.

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