Michael A. Peters · Petar Jandrić ·
Alexander J. Means *Editors*

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Preface

Technological unemployment is a crucial issue of our time. The evaluations of its likelihood vary with increasing reports coming down on the side of severe economic and social disruption, although there are dissenters who dispute the evidence and argue that the new technologies will produce as many jobs as they destroy. To us, this positive reading and prediction is based on a misreading of the nature of the new technologies and their convergence and synergy. With the so-called nano-info-bio-cogno technologies and their convergence, there is little doubt that we are not facing a straightforward and linear development. The changes are exponential and dynamic. They will be far reaching. When one contemplates the next generation driven by the power of quantum computing and advance algorithms that drive Industry 4.0 and 'intelligent' manufacturing, it is clear from emergent and early existing experimental practices that these tendencies will accelerate and lead to labourless factories working on a 24/7 cycle. This is not to embrace a technological determinism, but simply to recognize the strength of existing trends and national planning intentions.

Given this possibility, it is not a time for fear and trepidation but rather for rethinking the institutions likely to be most affected starting with the labour market and labour institutions and the role they play within the economy and society. If there is a significant reduction in the demand for labour, who will be most affected and how should governments and unions respond? That is the critical question set. It is also clear that the group most affected will be today's youth, who already experience the greatest levels of unemployment. The second concern are institutions which have the power to shape these trends for the future, including but not limited to education. How will education deal with this problem when the connection between education and work begins to dissolve?

Of course, it is necessary for labour and education institutions to engage in critical dialogues with all major parties and stakeholders in government-led policy discussions about what ameliorative actions can be taken. More importantly, however, this is also a time for critical reflection and creative thinking about the purposes and natures of these institutions. Indeed, if the transformation is like an avalanche then we need to fundamentally rethink these institutions and their

relationships with the rest of society. Ours is a time for philosophical reflection, for vision and imagination not just aimed at how we might hang on to what we have got, but rather as initiating a serious discussion about what our future may be. Once again, we need to rethink the future nature of society and a new set of principles for a new knowledge economy that creates possibilities for new forms of artificial and augmented intelligence, new forms of analysis and new forms of society. We need new forms of understanding the world around us, new forms of social struggle and new forms of education—to actively shape the nature human labour in the times to come.

Beijing, China — Michael A. Peters
Zagreb, Croatia — Petar Jandrić
Honolulu, USA — Alexander J. Means
November 2018

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Chapter 1
Introduction: Technological Unemployment and the Future of Work

Michael A. Peters, Petar Jandrić and Alexander J. Means

Introduction

Governments and world policy agencies have technological unemployment and the future of work on their agendas. The rapid innovation of Artificial Intelligence (AI) and deep learning in the last decade and convergent technologies and sciences—nano-bio-info-cogno; that is technologies and knowledge systems that enable each other (Bainbridge and Roco 2006)—have taken us by surprise both in their development and the scope of their applications. Governments are scrambling to think outside the square, realising that this is potentially a moment unlike any other in history. All signs indicate that the theoretical principle of the infinite substitution of capital for labour has arrived in applications of AI to labour processes alongside a huge gearing up for 'intelligent capitalism' across manufacturing and services. These trends point toward three scenarios. (1) An extreme scenario that argues jobs will disappear ('joblessness'). (2) A hybrid scenario with human beings firmly in control which argues we can change the future and we should go for an augmented intelligence rather than autonomous learning systems ('hybrid'). (3) A business-as-usual scenario which states that AI and intelligent systems are just another tech-hype discourse that will erode but also create some jobs ('normal'). All three scenarios are based on theoretical models of change, but the first two recognise that there is something at work which is different from old linear industrial processes of scale and assembly. They point to a dynamic model of change that works as complex, nonlinear, dynamic, system transformations inherent in the promise of the quantum model as probabilistic

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in principle, thus threatening the classical idea of causality of physical systems and the notion of scientific realism. This probabilism makes the future very hard to predict and public policy very difficult to develop. If either the first or second scenarios are more likely to be correct then we face a bumpy future, especially in those Western societies that fashion themselves on the principles and institutions of the capital/labour duality: liberal democracy representing two dominant parties reflecting business and unions within legal frameworks organised through the state.

Futures of Work and Education

The G7 Future of Work Forum (2018) outlines these dynamics as well as the anxiety of confronting a future where labour markets are changing with jobs at risk from automation, with deepening labour market polarisation, and rising inequalities. The OECD Automation Policy Brief (OECD 2018) confirms that 14% of jobs are automatable and another 32% will face substantial impact in how they are carried out. It details that as AI and machine learning capabilities develop, young people will find it harder to enter the labour market, and while jobs in manufacturing and agriculture face greater risk of automation, jobs in the service sectors are not immune to change. The greatest risk is to low skill routine jobs and education and training will not offset risks of automation. As automation takes effect more broadly it creates downward pressure on wages and working hours. One of the key priorities stated by the OECD is the unequal distribution of risk across the population. There is a strong emphasis on education as a major part of the solution. The Brief argues:

> Education systems will need to adapt to the change brought about by automation and teach children the skills that allow them to take full advantage of the current wave of technology adoption. This includes skills such as cognitive and social intelligence but also extends to the skills needed to work in a digital context, both as specialists and as users of digital technologies. (OECD 2018: 4)

Governments and agencies have launched various 'future of work' forums in the last few years. The International Labour Organisation (ILO) launched 'Future of Work Initiative' in 2015 with a report from the Director-General (DG) that emphasises the links between jobs, poverty and social protection (and the increase in youth unemployment), the internationalisation of production, the quality of work, and likely future developments. The report then questions the place of work in society and the basic imperative of work to meet social justice concerns. The DG focused on a number of important themes to guide a three-stage investigation culminating in a general report in 2019:

> *Work and Society* – How the transformations in the world of work are affecting how individuals interact and how will societies manage these changes.
>
> *Decent Jobs for All* – How the interplay of technological innovations, structural transformation, economic development and social change are expected to shape the future of work, particularly in relation to the longstanding policy commitment to full and decent employment.

> *How youth of today see the future of work and how they will contribute to ensuring the future we want?* – What are the challenges and opportunities young people are facing as they make the transition into the world of work. What do they see as the path forward to achieve sustainable inclusive growth for future generations?
>
> *The Organisation of Work and Production* – What are the new forms of the employment relationship and whether and to what extent that relationship will continue to be the focus for many of the protections now afforded to workers.
>
> *The Governance of Work* – Focus on initiatives that revitalise existing norms and institutions and/or create new forms of regulation that may help to meet present and future governance challenges. (International Labour Organisation 2018a)

Synthesis Report of the National Dialogues on the Future of Work (September 2017) appeared recently and The International Labour Organization (ILO) has established a high-level Global Commission on the Future of Work (International Labour Organisation 2018b). The global body is expected to undertake an in-depth examination of the future of work that can provide the analytical basis for the delivery of social justice in the twenty-first century. The Commission will focus in particular on the relationship between work and society, the challenge of creating decent jobs for all, the organisation of work and production, and the governance of work.

In the submission by Italy to the ILO centenary 'The Changing World of Work: Digitalization, Automation and the Future of Work' the report begins: 'The current technological transformation, based on the interweaving of digitalization and automation of socioeconomic relations, is creating profound changes in the world of work'. It continues:

> The challenges facing the world of work concern the risk of technological unemployment; the quality and conditions of work, with the effects that automation can have on the control and reorganisation of times and procedures for task execution; the risk of rising levels of economic inequality, with the more highly qualified workers seeing an increase in employment opportunities and income conditions at the expense of those employed in lower-skilled jobs; the rise of new jobs and new markets characterized by the absence of regulations that can guarantee adequate rights and protection as well as the proper appreciation of work. These risks come in addition to a series of pre-existing, crucial challenges that the Italian economy and world of work are confronted with, such as the ageing of the population, the need to reduce gender disparity in the labour market (in terms of greater female participation, of a reduction in the gender pay gap and of the fight against violence in and out of the workplace), territorial imbalances and the necessity to ensure the sustainable internationalization of economic relations. (Ministero del Lavoro 2018)

The Italian submission also acknowledges that 'new technologies provide important opportunities of increasing quality employment' and the report talks of risk management through taking advantages of new job opportunities in line with the national industrial 4.0 plan to grow new start technological businesses that aim at green production with a focus on new types of jobs, on-the-job training and education. The Italian government stresses social protection, reduction of inequalities and gender pay gaps. On technological unemployment the report mentions some required exploratory activities as well as guidelines:

Required exploratory activities:

1. Empirical analysis that provides a detailed picture of the organisation of employment (by sector, geographical area, gender, age-group, qualifications, profession, duties, skills) and the rapport between this and the technological characteristics of businesses and sectors.
2. Analysis of the evolution of jobs and task content to enable the detailed mapping of the current organisation and the future developments, in as much detail as possible.
3. Analysis of the role of human capital (with particular reference to digital skills) and its impact on the performance of workers and businesses.
4. Identify the strong and weak points of the compensatory mechanisms through which the demand for new jobs should compensate for the loss of those jobs that have become obsolete due to technological advancements.

Guidelines

1. Organise a coordinated set of active labour and social protection policies that take into account the diverse consequences that technological change can have on different production sectors and on different geographic areas.
2. Foster transitioning of sectors, professions and responsibilities to minimise the risk of technological unemployment and to reduce the related social cost.
3. Strengthen the services for public and private work by exploiting information flows and available data elaboration technologies in order to increase the efficiency and timeliness of the support offered (Ministero del Lavoro 2018).

In addition, the submission mentions under Technological Unemployment (1.0), Welfare and Technological Change, a set of country-specific activities:

1. Welfare and Technological Change a set of country-specific activities
   1.1. Enhance and upgrade the skills of workers and enterprises
   1.2. Quality of Employment and work conditions
   1.3. Youth employment and the school-work transition
   1.4. Integrating supply and demand-side and industrial policies
   1.5. Platform Economy.
2. Welfare, co-operation and social investment
   2.1. Strengthen the welfare state and the social infrastructure
   2.2. The role of cooperatives and social enterprises.
3. Technological change, globalisation, demographic dynamics and migration
   3.1. Globalisation and technological change
   3.2. Ageing of the population and migration flows (Ministero del Lavoro 2018).

A future of widespread joblessness and erosion of work and livelihoods is a frightening one, especially for young people, who will encounter intensification of competition for a decreasing pool of available jobs with higher entry qualifications and conditions, and lower wages. The future of work for this scenario looks bleak even if we admit that the process is not one of simple elimination of jobs through sophisticated automation and the application of intelligent systems to the world of work. The process may, in fact, be highly uneven by eliminating some jobs but

creating others in line with the new information services and global growth of Internet aggregators. The job loss scenario can also be mitigated by government labour market, education and social policies with the more far-sighted responses including the notion of government-sponsored public and community services with particular focus on areas of social care. Perhaps the most concerning issue is that as the traditional link between work and education no longer holds; there will not necessarily be a relationship between a university education and a guarantee of work. In the immediate term, this situation may intensify the scramble for job-related courses and degrees concentrated in those professions that show economic returns much in the same way that we saw the mad rush for MBAs during the sustained bull market era leading up to the Global Finance Crisis in 2008. There will be short term market rushes for degrees that can demonstrate some connection to digitisation processes.

Speculative Responses to Automation

It is not clear what function education will serve in an era of widespread automation once the vocational justification is removed. Indeed, as a thought experiment it is useful to contemplate the question: *what is the purpose and function of education in the age of widespread automation once labour as a set of processes and as a political category has disappeared*? An initial response posits that once the purely utilitarian options become more difficult to pursue and the general ethos of education for work begins to falter, other possibilities will depend upon creative policy work such as the expansion of the 'third sector' based on corporate-government-community partnerships; the revival of D-I-Y job cultures; the growth of small businesses and self-employment in food, hospitality and other industries; education for design, media and creative arts that encourage a raft of new platform initiatives; intensification of all competitive talent programmes in sport, fashion and entertainment; large-scale sponsored survivalist and cooperative living programmes; the cultivation of traditional arts and crafts; increasing development of second-hand markets and waste management industries; an environmental education that monitors resource depletion and water and air quality at the local level; and perhaps, the revival of the liberal arts education with emphasis on collective processes that aid citizenship and imaginative citizenship projects. In this response that we might call 'community' or 'third sector', there are many possibilities that will develop out of existing initiatives and practices. In effect, this will signal an ethos of the recognition of the *diversity* of work practices.

A second response is associated with a neoliberal business-as-usual approach that advocates education for digital skills to equip kids (and adults) for the (shrinking) digital economy—more programmers, more Internet developers, more entrepreneurial platform providers, 'more digital literacy', more ed-tech, more technicians, more gamers etc. This strategy relies on the largesse of Silicon Valley behemoths such as Google, Apple, Amazon, Microsoft, and Facebook that are inventing and profiting from the financial and technological infrastructures of a potential labourless and workless society, hastening the prospect of unpaid and free labour, while further entrenching digital monopolies and inflating stock values. Here, education becomes

a digital factory or warehouse serving the digital economy, with emphasis on digital job creation and use of platforms to launch new digital services and apps (Means 2018). Inevitably, in this neoliberal response, policy pundits will ask 'why not simply let the big information utilities run education', either privately, or in conjunction with the state? The philosophy is that we live in a digital world, we are digital citizens, let us make digital boys and girls so they can grow up to be digital adults. This is not to say that the neoliberal response is not realistic. It is now the dominant and likely response, but philosophically minded policy scholars need to come to grips with deeper questions concerning education and digital labour (Peters and Bulut 2011; Peters and Jandrić 2018) as well as questions concerning digital learning, digital citizens, and digital beings (or rather digital becomings) (Peters et al. 2019). Ultimately, this critical approach to postdigital policymaking and analysis depends on investigating and critiquing bio-informational capitalism (Peters and Jandrić 2019)—is it a new kind of paternalistic capitalism that envelops its workers from 'cradle to grave'? Do we all have to sing the Google company song or mimic the words of the Facebook slogan? Let's be Amazonians and wear, eat, sleep Amazon. Life is a giant warehouse.

The third response is focused on augmented intelligence and utilises machine–human learning and controls. It stipulates that, if directed by humans, AI can achieve data analysis and calculations at lightening speed, feeding back the data in a managed form with deep configurations and patterns that would take teams of human many months if not years to complete. This accommodation works as an augmented system that combines elements from both worlds—the data analytical tools of machine learning and deep learning on the one hand and the creative intelligence of design engineers or technologists. It tries to achieve a new comfortable working relationship between AI and human beings in the world of work and promotes or profiles this sector as a preferred future that means making the necessary social and political arrangement for the harmonising of humans and machines with legislation to regulate the ethical issues of control, ownership, data management and privacy issues. This area requires more research to examine models of harmonisation at the firm and individual level. One aspect might be that the augmented intelligence option is pursued and supported if it shows promise of generating new forms and synergies between education and employment.

The fourth response is based on the assumption that the relationship between labour and value is historically broken, or about to be broken, and that, in particular, there is no guaranteed ongoing relationship between education, labour, wages or salary. Confronting the possible harsh reality of this event (broken history) would reveal the extent to which the modern world economy and its psychology are tied to the concept of labour. (We for the moment will use labour and work as interchangeable, knowing that Arendt makes an important distinction). This broken economic and psychological link will not happen immediately but will happen first for large groups of unemployed youth. Already 20–30% of youth experience unemployment in some Mediterranean economies. But what would it be like for such groups to experience unemployment as a permanent condition? This profound existential question that refers to identity issues and also to societal institutions must be rethought at a philo-

sophical level. Only if this question is treated philosophically can 'we' the workless peoples of the future begin to hypothesise the positive side of unemployment—and not just the old 1970s mantra of 'the leisure society' where benignly machines do all the drudgery work leaving us humans to pursue the higher creative arts. In this fourth response, it makes sense first to examine how the concept of labour defines our everyday life—our working lives, but also our family life, including household arrangements, meals, homework, weekends, etc. So much of our individual identities are tied to the concept of labour. Some thinkers define us—our very being in its essence—in terms of labour. This is the basis, for instance, of radical political economy.

Overview of the Volume

In *Shaping the Future of Work: A Handbook for Action and a New Social Contract* Kochan and Dyer (2017) argue that 'the deep division that was laid bare by the 2016 presidential election and by parallel developments around the world' has predominantly taken shape 'between those who have done well and see the future of work as full of opportunities and those who feel that they and their families are being left behind and are angry about their current circumstances and worried about their futures'. They suggest:

> The main source of the challenges the work forces of today and tomorrow face is the fact that the rapid pace of globalization changes in technology and demographics has outpaced many of the public policies, business strategies, and organizational practices that were designed in an earlier era to govern work, pay, and employment relations. Closing this gap by updating these policies, strategies, and practices is essential to building a world of work where all can prosper. (Kochan and Dyer 2017: 2)

As Kochan and Dyer note, developments in AI and machine learning are likely to intensify social conflicts while presenting new challenges for governments and policy-makers. Technological displacement of labour has the potential to raise economic productivity and efficiency as well as possibilities for transforming production, labour, exchange, and collaboration. However, without serious debates and modifications in how we distribute wealth and index the value of labour, inequality will intensify as wealth accumulates mainly to those in a commanding position in relation to emergent financial and technical infrastructures. Such an outcome would likely fuel new social divisions and instabilities, which in the current context have given rise to various expressions of ethnonationalism and reactionary populism.

There have been many proposed solutions to addressing the potential negative impacts of labour saving technology, including the Luddite strategy of refusing innovation as well as more progressive solutions of welfare provision, public employment, and a universal basic minimum income. These solutions almost always involve some kind of educational vision. For instance, mainstream economists, CEOs and policy-makers argue for transforming educational focus from the humanities and social sciences to science, technologies, engineering and mathematics (STEM) in

order to foster human capital, entrepreneurship and innovation. However, in a world which simply does not offer enough work for everyone, education is clearly not a panacea for technological unemployment. The challenge of accelerating automation requires new methodological, philosophical, scientific, sociological, economic, ethical and political perspectives that fundamentally rethink the categories of work and education. What is required is political will and social vision to respond to the question: *What is the role of education in a digital age of potential mass technological unemployment?*

The volume is divided into three parts focused broadly on the impacts of emergent technology on education and work, the limits and possibilities of education as a means of addressing technological unemployment, and rethinking educational purpose and value within a post-work context.

Part I: The Postdigital Fragmentation of Education and Work

The first part addresses the fragmentation of education and work in the postdigital context. Michael A. Peters and Zhao Wei explore the implications of artificial intelligence for the future of work and education. From the perspective of the sociology of labour, they analyse technological trends and potential impacts on educational systems. Mobilising André Gorz and Bernard Stigler's post-work perspectives, they suggest alternative conceptions of the employment/education nexus in an era of intelligent capitalism. In his contribution, Greg Thompson examines technological disruption in relation to the form and function of the university. Drawing on Deleuze, Thompson suggests higher education is intimately tied to psychological and social investments and anxieties related to precarity in the digital control society. Following Thompson's insights, Richard Hall delves deeper into the political economy of higher education, suggesting that the real consumption of academic labour presents a set of distinct contradictions and challenges to digital capitalism by eroding its social, immaterial and intellectual basis of valorisation. Next, Tina Evans discusses the limits of technology for addressing the current crisis of employment, sustainability, and democracy. She suggests these challenges generate modes of enforced dependency that lock us into narrow educational assumptions and responses. In contrast, we need to envision forms of higher education that cultivate new human capacities of creativity, transdisciplinary engagement and empathy to ensure just and sustainable futures. In their chapters Chris Arthur and Neil Frude both explore the ethical and psychological dimensions of the automation revolution. Arthur focuses on how the automation and technological disruption is generating new pressures on educational systems to produce entrepreneurial subjectivities that individualise and moralise divergent socioeconomic outcomes and pathways. Frude provides a contrasting vision suggesting that compulsory employment produces forms of psychological pathology and that AI and intelligent software present an opportunity to reimagine mental health and work to enrich lives and communities. In the final

chapter, Steve Fuller considers the future of the human and humanity within a context of artificial intelligence and human–machine symbiosis.

Part II: What Can Places of Learning Really Do About the Future of Work?

The second part of the book considers education as a response to technological disruption of labour and society. Sam Sellar draws on the concept of accelerationism, which posits that capitalism and technological development form a modern assemblage that cannot be regulated except in partial and temporary ways. Such an idea of acceleration calls into question mainstream economic and educational ideas that assume pedagogy can prepare students for the future. New models of educational thought are required to contend with acceleration of technology and capitalism. From a different angle, George Lăzăroiu provides a big picture analysis of the impact of technology on labour markets, highlighting nuances in the evolving structural relationship between education and automation of work. In her chapter, Sarah Hayes mobilises critical discourse analysis to examine a large data set of higher education policy documents, synthesising their logics and raising questions in relation to the educational purpose, automation, and posthumanism. Tristram Hooley compliments these perspectives by considering the impacts of automation on career guidance in higher education. In the final chapters, Nataša Lacković and Murray Robertson present two alternatives to the educationalisation of technological change by centring socio-emotional relations and notions of care within debates over the future of education and work.

Part III: Education in a Workless Society

The third part of the book engages post-work perspectives on education. Nathan Schneider provides a historical analysis of the university as a basis for considering cooperative enterprises and Platform Cooperativism. Alexander J. Means argues mainstream economic conceptions of education and employment are losing coherence as technological displacement of labour tracks with global economic stagnation, precarity and inequality. Mainstream economic, post-Keynesian, and emergent radical-progressive perspectives on post-work alternatives for education and society are each considered as responses. Similarly, Patrick Carmichael examines two strands of post-Marxist thought on the refusal of work: Italian *operaismo* or 'workerism' of the 1960s, and the humanist Marxism of André Gorz. Each of these strands of work refusal provides insights into how educational systems might evolve in the face of new waves of automation. In his contribution, Michael Gallagher examines microwork and on-demand labour enabled by emergent digital platforms. He argues

that 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. Jeremy Knox provides a critical analysis of 'machine learning' in education and its relationship to the discourses of technological unemployment. The promotion of machine learning in education is shown here to tend towards a narrative of 'disruption'. Framed as an essential future skill, and accompanied by a prominent public discourse of imminent job-replacement, this trendency is clearly directed towards 'professional' and 'creative' occupations. Mark Dawson takes up Bernard Stiegler's recent engagement with the theme of automation, and outlines an approach which puts automation to work at the point where higher education institutions (HEIs) join with the communities and networks in which they are rooted. Through the notion of 'epistemic health', he explores a counterpoint and suggests how we can transform HEIs from recipients of technologically driven social change into its careful co-creators. In the final chapter Michael T. Hayes employs a conception of Utopia as a method to examine the question *What could education become in a post-alienated labour world?*

Education and Technological Unemployment

This book presents an overview of current thinking on complex and fuzzy relationships between education and technological unemployment. In the postdigital age, characterised by 'blurred and messy relationships between physics and biology, old and new media, humanism and posthumanism, knowledge capitalism and bio-informational capitalism' (Jandrić et al. 2018: 896; see also Peters and Besley 2018), this theme is of everyone's concern. Therefore, we tried to reach authors working in a wide spectrum of disciplines, including but not limited to education studies, philosophy, history, politics, sociology, anthropology, information science, economics, arts, and others, and from wide range of disciplines and inter-, trans- and anti- disciplinary research methodologies. We tried to reach 'optimists' and 'pessimists' and people who subscribe to 'joblessness' scenarios, 'hybrid' scenarios, and 'normal' scenarios defined at the beginning of this introduction. However, there is much more to the relationships between education and technological unemployment than we can ever hope to explore, and it is abundantly clear that the theme requires deep engagement from various people who could not, for one reason or another, contribute to the book. We are not at all disappointed with this prospect, because we believe that this book might make an important stepping stone towards a wider 'postdigital dialogue' about education and technological unemployment which 'is crucial for both illuminating the hegemonic myth of technological development and unmasking the promise of capitalist prosperity, and for developing emancipated and creative democratic subjectivities and relations' (Jandrić et al. 2019).

Technological development is nonlinear, uncertain, and unpredictable. It is dialectically intertwined with global capitalism and its poisonous preference for profit over people. Yet, it is important to remember that the accelerationist logic which results

in merciless replacement of human labour with machines is only one of many possible ways of socio-technological development. We need to dare to imagine and think out of the square. We need to develop fresh responses to current problems of technological unemployment and to imagine different technologies intertwined with different social arrangements. Authors in this book analyse problems of today, but more importantly they dare to imagine radically different futures. If we had to choose only one message that this book will bring into the debate, then it is the call for open minded imagination and wide social dialogue. So let us unmask false inevitability of the current direction of capitalist development and continue to imagine different relationships between technologies, employment, and education—and let us do it together, in a dialogue, and in a hope for building a world that we would like to inhabit in the future.

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Part I
The Postdigital Fragmentation of Education and Work

Chapter 2
'Intelligent Capitalism' and the Disappearance of Labour: Whitherto Education?

Michael A. Peters and Wei Zhao

> [T]o the degree that large industry develops, the creation of real wealth comes to depend less on labour time and on the amount of labour employed than on the power of the agencies set in motion during labour time, whose 'powerful effectiveness' is itself in turn out of all proportion to the direct labour time spent on their production, but depends rather on the general state of science and on the progress of technology, or the application of this science to production.
>
> —Karl Marx, *Grundrisse: Foundations of the Critique of Political Economy*

Introduction: The End of Labour?

S. C. Hickman in his Social Ecologies blog begins with this quotation from Marx to suggest that 'Marx had already foreseen the end of labour': wealth is more concerned with the 'power of *agencies*', technics, technological improvement and abstract control of temporal processes than labour time per se. As he goes on to argue:

> Automation changes everything: Direct labor of humans is no longer of exchange or use value in digital capitalism, and must be excluded from the wealth accumulation cycle as part of its functional computationalism. Humans are no longer needed in the capitalist world of circulation of profit, therefore are no longer needed for the extraction of *surplus value*. (Hickman 2017)

This realization is based on the simple understanding that labour is disappearing because in digital or algorithmic capitalism, the capitalism of the 'intelligent systems', labour is no longer a factor of production. In the age of industrial capitalism, agricultural or farm labour disappeared as a result of mechanization; in the age of

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'intelligent capitalism' based on the development and application of intelligent systems, jobs in manufacturing and services will disappear.

McKinsey's (2017) *Artificial Intelligence: The Next Digital Frontier* begins with the following assertion:

> Artificial intelligence is poised to unleash the next wave of digital disruption, and companies should prepare for it now. We already see real-life benefits for a few early-adopting firms, making it more urgent than ever for others to accelerate their digital transformations. Our findings focus on five AI technology systems: robotics and autonomous vehicles, computer vision, language, virtual agents and machine learning, which includes deep learning and underpins many recent advances in the other AI technologies. (McKinsey 2017)

The report recognizes how digital capitalism is now dominated by the global giants such as Google and Baidu that spent a combined $20–30 billion on Artificial Intelligence (AI) in 2016, mostly on research and development and suggest that there are real advantages for early adopters. The report is limited in that it does not comment on the loss of employment or role of government but simply focuses on the transformation of industry.

Purdy and Daughterly (2017: 3) addressing the question 'Why artificial intelligence is the future of growth' comment that there has been a marked decline in the two levers used to boost production. Both capital investment and labour are no longer able to sustain growth.

> But long-term pessimism is unwarranted. With the recent convergence of a transformative set of technologies, economies are entering a new era in which artificial intelligence (AI) has the potential to overcome the physical limitations of capital and labor and open up new sources of value and growth. (Purdy and Daughterly 2017: 3)

They suggest that AI is the missing element that will affect the future of growth. Capital and labour as the 'factors of production' will give way to a transformative set of technologies known as AI, which can be considered as a capital-labour hybrid where 'AI can replicate labour activities at much greater scale and speed, and to even perform some tasks beyond the capabilities of humans' (Purdy and Daughterly 2017: 5). AI can also take the form of physical capital such as robots and intelligent machines with the additional capacity to improve its capabilities over time through self-learning. On the basis of their modelling and analysis, they claim that AI can be considered a new factor of production with a transformative effect on growth.

By 2019, more than 212 million people will be out of work, up from 201 million in 2015, according to the International Labour Office's (ILO) report, *World Employment and Social Outlook—Trends 2015* (International Labour Organization 2015). The ILO predicts income inequality will continue to widen and that already the richest 10% earn 30–40% of total income while the poorest 10% earn around 2% of total income. The ILO has warned of the severe consequences presented by automation and disruptive technologies but few agencies have raised questions about the ontological basis for work, its declining importance for capitalism since its symbolic, financial and algorithmic turns, or indeed the social and psychological prospect of workless capitalism. Fewer still begin to approach these questions in terms of the disappearance of labour as a factor of production. What if, under systematic adoption of intelligent

systems in manufacturing, labour is in the historical process of disappearing? What then becomes the role for education, when education is increasingly conceived in labour market terms? Is there a sociology of labour equal to these questions?

The Sociology of Labour

The sociology of labour has gone through many different phases studying the advent and progress of the changing mode of production beginning with early critiques of industrialism. Marx's theory of alienated labour provided in this chapter sprang from an early text and from Marx's reading of Hegel's metaphysics.[1] The Marxist notion of the self, at least in the early Hegelian Marx of *Economic and Philosophical Manuscripts of 1844* (Marx 1844), pictured work or labour as central to the subject and identified four major types of alienation (*Entfremdung*): alienation of the worker from the product of his labour, from the act of producing, from his species essence, and from the relations of production. For Hegel, the unhappy consciousness is divided against itself and separated from its 'essence'. Marx builds on this metaphysics to portray wage labourers who in the capitalist mode of production are deprived of a life as socially productive agents because they have no ownership over their own labour or the products of their labour. Thus, for Hegel and Marx, to be alienated is to be separated from one's own essence, or one's nature. That creates a deficit of self and self-worth, and also the absence of meaning in one's life. Labour is the central category in Marxist phenomenology of the subject: it is the source of active self-realization as opposed to a life of passive consumption under capitalism.

The progress of humankind towards self-actualization depends upon the realization of species being which involves the triumph against all forms of alienation in socialist society. Marx takes issue with Adam Smith over the nature of work and castigates him for not seeing that work is in itself a liberating activity and a form of self-realization and real freedom when labour creates the subjective and objective conditions for itself and its social character is revealed. Drawing on Hegel, Marx argues that labour is central to one's self-conception and sense of well-being. Labour is as much an act of creation and the formation of one's identity as it is a means of survival. Capitalism as the system of private ownership of the means of production deprives human beings of this essential source of self-worth and identity and expropriates the products of their labour which are sold for profit. There is much in this account as a phenomenology of work or labour and the worker: one's subjectivity is intimately tied to work as the central metaphysical category. Whether we embrace a species being, individual being or historical ontology, it is clear that for the majority of people, work is a fundamental aspect of their subjectivity, with clear exceptions of those who are forced to work for nothing in return ('slaves') and those who through accumulated wealth and position do not have to work at all. But this metaphysical category is transcendent because labour is a process of objectification and a forma-

[1] This section draws on Peters and Besley (2013).

tive activity that literally gives form to materials. This is a 'productivist' model of labour that employs an essentialist phenomenology to argue that labour is a central ontological category defining the nature of what it is to be human.

Today, after the post-war successive waves of post-industrialism from knowledge economy and cognitive capitalism to the employment of intelligent systems, the productivist model of labour has been questioned as outdated and for not understanding new immaterial forms of labour that are coming to predominate in the post-industrial world. Contemporary social theory is moving closer to traditional philosophical questions of the constitution of self not only in relation to work and the Hegelian problematic of self-realization that informs Marx but also in relation to culture, multiculturalism, the constitution of the citizen and global citizenship, on the one hand, and the new information and communications technologies and whether they form a mode of information akin to the mode of production, on the other. These newer identity studies seek the manufacture of consciousness and subjectivity in more nuanced ways emphasizing cultural processes of formation within larger shifts concerning globalization, the knowledge economy and the movement of peoples across national boundaries and frontiers.

The early nineteenth-century phenomenology led to sociological studies that in succession focused on factory organization and the Taylorist 'science of management' the aim of which was to improve labour productivity by applying the scientific method to study work and determine the most efficient way to perform specific tasks, matching workers to jobs based on capability and monitoring worker performance. Taylorism was mainly with concerned division of labour and with the transition from craft-based employment to factory labour before large scale mechanization and automation took place. While Taylorism largely preceded Fordism (named after Henry Ford), the assembly line and other Fordist principles were arrived at independently. Standardization of products and the focus on the industrial process of breaking down complex tasks into its simplest elements kept costs down but also deskilled workers. The Fordist phase of capitalism was theorized to succeed the classic free-market form by the French Regulationist school based on Althusserian structuralism (Aglietta 1976; Boyer and Saillard 2002) which studied the transformation of social relations as it creates new economic and social forms organized in structures and reproducing a determinant structure called 'the mode of production'.

Jessop (1992) identifies four different levels on which Fordism and post-Fordism have been analysed:

1. As a distinct type of capitalist labour process, Fordism refers to a particular configuration of the technical and social division of labour involved in making long runs of standardized goods.
2. As an accumulation regime, i.e. a macroeconomic regime sustaining expanded reproduction, Fordism involves a virtuous circle of growth based on mass production and mass consumption.
3. Fordism can also be examined as a social mode of economic regulation, …i.e. as an ensemble of norms, institutions, organizational forms, social networks and patterns of conduct that sustain and 'guide' the Fordist accumulation regime and

promote compatibility among the decentralized decisions of economic agents despite the conflictual character of capitalist social relations.
4. Considered as a generic mode of 'societalization', i.e. pattern of institutional integration and social cohesion, Fordism moves social relations further towards a mass [salaried society]. (Jessop 1992, abridged)

Jessop points out that the diffusion of Fordism was quite limited with only a small proportion of the workforce ever employed in Fordist manufacturing with proportions varying with different style economies. Thus, he claims its explanatory force for understanding the labour process has been overplayed. He also raises critical questions about the Fordist regime of accumulation and how one might identify it, the wide variation of social modes of regulation with Fordism, the mode of societalization, and the periodization of Fordism. He recommends that Fordism should 'be defined in terms of a core mode of regulation whose minimum features comprise: a wage relation in which wages are indexed to productivity growth and inflation, the state has a key role in managing demand, and state policies help to generalize mass consumption norms' (Jessop 1992: 20).

Piore and Sabel (1984) in *The Second Industrial Divide* warned in the 1980s that the Fordist model of work was about to come to an end, suggesting that the Fordist model of organization is being challenged by new forms of the division of labour that reflects a strategy of permanent innovation. The transition to post-Fordism must be analysed in the same way. Jessop emphasizes post-Fordism as a labour process in terms of a 'flexible production process based on flexible machines or systems and an appropriately flexible workforce. Its crucial hardware is microelectronics based information and communications technologies' (Piore and Sabel 1984: 23). Flexible specialization with small batch production characteristic of small- and medium-size firms in order to adjust very quickly to a fast-changing marketplace and business environment has greater scope for defining a global labour process model although it also faces criticism. Beginning in the 1980s, there was a strong movement to emphasize the diversity of capitalism to escape the neoclassical emphasis of abstract laws of development after Andrew Shonfield's work providing a counter to the easy arguments of globalization that predicts a convergence thesis with Michel Albert defining two types of capitalism in geocultural terms as Anglo-Saxon and Rhenish. Hall and Soskice's (2001) *Varieties of Capitalism* epitomized this approach. Even neoliberalism, the world model based on Chicago school economic abstractions, was theorized to admit of divisions- including 'market', 'managed' and 'state' models of capitalism (Crouch 2005).

Since the Second World War theorists from different perspectives and disciplines—sociology, economics, education, communication and media studies—have analysed and described certain deep-seated and structurally transformative tendencies in Western capitalism and society, signalling a fundamental shift from the industrial to a post-industrial economy that focuses on the production and consumption of knowledge and symbolic goods as a higher order economic activity. While scholars differ on its societal effects and impacts, most theorists agree on the epochal nature of this deep economic transformation and the way in which it represents an ongoing

automation of labour and technologization of processes of scientific communication, including the access, distribution and dissemination lying at the heart of knowledge creation and transfer economies. The knowledge, learning and creative economies manifest the changing significance of intellectual capital and the thickening connections between economic growth and knowledge. It is an important intellectual task not only to provide a chronological order for the set of readings that emerged concerning the emergence of the 'knowledge economy' but also to recognize that different readings proceed from quite diverse premises and are based on political assumptions. Clearly, not all are based on neoliberal fundamentals. Interpretations and the genealogy of the knowledge economy are conflicted and sometimes contradictory (Peters 2009). Yet the economics of knowledge reveals a deep structural transformation with strong implications for the future and sociology of labour with prolonged and intensive education and high skill knowledge requirements increasingly formulated in terms of STEM conceptions that to a large extent rules out the traditional humanities and arts (Peters and Besley 2006).

Caruso (2016) distinguishes between the managerial paradigm (Drucker, Stehr, Floridi) that considers the knowledge economy 'a historical transformation in the mechanisms of value creation and in the relationship between economy and society'. As he states: 'These authors argue that all work has become cognitive. In advanced capitalism, there no longer exist jobs that do not require creativity or the use of mental faculties that are not functional to mere execution'. (Caruso 2016) Business webs and crowdsourcing based on the open-source movement provide the means for outsourcing, focused on including social groups in the production process and value chain. While crowdsourcing opens to forms of new social labour the network organization still remains hierarchical. What is more, as Caruso (2016) explains, both claims concerning 'the democratization of the market and the socialization of strategic knowledge' are open to question. By contrast, cognitive capitalism and post-workerism is the leftist account of contemporary knowledge techno-capitalism that depends on 'participatory modes of innovation and to open models of intellectual property' often seen 'as antithetical … to industrial capitalism'. Under this competing paradigm, the labour can no longer be measured by time as with traditional labour theory under Ricardo and Marx but rather must be measured by knowledge surplus and added symbolic value.

The theory of cognitive capitalism—sometimes referred to as 'third capitalism,' after mercantilism and industrial capitalism—is an increasingly significant theory, given its focus on the socio-economic changes caused by Internet and Web 2.0 technologies that have transformed the mode of production and the nature of labour (Peters and Bulut 2011; Jandrić and Hayes 2018). It has its origins in French and Italian thinkers, particularly Gilles Deleuze and Felix Guattari's *Capitalism and Schizophrenia* (1988), Michel Foucault's work on the birth of biopower (2007), Michael Hardt and Antonio Negri's postmodernization (2001), as well as the Italian

Autonomist Marxist movement that draws on an Italian post-workerist perspective following the works of Negri, Hardt, Lazzarato, Fumagalli and Vercellone. As Caruso argues

> under cognitive capitalism, production directly invests social reproduction and territories, engendering a major contradiction between the Marxian general intellect—the social knowledge embedded in machinery systems and in work organization—and "living labor", that is, workers' creativity, abilities, skills, emotions and relations. (Caruso 2016)

In any review of contemporary sociology of labour in relation to the disappearance of labour as a factor of production needs to take into account also emerging global systems of finance, so-called finance capitalism and processes of globalization that represent financialization as a systematic transformation of capitalism based on the following trends: (i) the massive expansion of the financial sector where finance companies have taken over from banks as major financial institutions and banks have moved away from old lending practices to operate directly in capital markets; (ii) large previously non-financial multinational corporations have acquired new financial capacities to operate and gain leverage in financial markets; (iii) domestic households have become players in financial markets (the ascendancy of shareholder capitalism) taking on debt and managing assets; and (iv) in general, represents the dominance of financial markets over a declining production of the traditional industrial economy such that World Domestic Production (WDP) estimated at $60 trillion pales in significance to world derivatives markets value at some $1.4 quadrillion annually. Financialization thus reduces all value to financial instruments or their derivatives thus making possible risk-sharing in insurance and the global trading of treasury bonds, futures and world currencies. These developments have their roots in neoliberalism in the late 1970s with the rise of free-market doctrines that encouraged the deregulation of financial systems, the massive sale of state assets and a programme of parallel privatization in the social sector of the economy, including the institutionalization of student debt and the growth of private medical insurance (Peters et al. 2014; see also Peters 2013).

There is much more to be said about the relationship between financialization and AI, and the application of deep learning to manufacturing which is somewhat different from algorithmic capitalism. This is where the thesis of the disappearance of labour has relevance and resonance. Morris et al. (2017) discuss the application of AI and ML to manufacturing:

> In manufacturing, autonomy will be realized as machines become more capable of detecting and responding to changes in their own performance; they may become capable of eventually predicting the need to adjust their performance based on system inputs or changing priorities. Robots, which are now typically restricted by safety zones, will become more capable of close interaction with their human operators as sensing and response capabilities improve. Beyond subsystem autonomy, we may begin to see symbiotic systems with new assistive technologies that enhance the capabilities of human operators, such as immersive environments that allow a person to remotely control higher-level operations and predictive retrieval that anticipates what a person will need. (Morris et al. 2017: 408)

In these circumstances where the need for labour fades what purposes will education serve (Peters 2018)?

The Advent of Intelligent Systems

Intelligent systems draw on machine or 'deep' learning to mark the end of labour and the final stage of automation (Peters 2018). As D'Amato (2014) writes:

> Some analysts claim we have entered a 'post-industrial' society in which automation is shrinking, if not eliminating, the working class. As a result, workers no longer have the power that Marx attributed to them. 'Capital has succeeded,' writes French radical author André Gorz in 1980, 'in reducing workers' power in the production process.' (D'Amato 2014)

If anything, this tendency has been clearly demonstrated by the application of intelligent systems to manufacturing. Zhang et al. (2017) note the recent history of 'intelligent manufacturing':

> With the development of a new round of revolution of science and technology, the traditional manufacturing industry is gradually upgrading to the direction of intelligent manufacturing [1]. In the 1980s, the Intelligent Manufacturing Center of Purdue University formally proposed 'Intelligent Manufacturing'. In 1998, the United States of America released the first monograph named 'Manufacturing Intelligence' which discussed its connotation, prospect as well as its conception that 'The process of making use of technologies about knowledge engineering, manufacturing software and robot visual for intelligent robots to accomplish a batch of production missions without artificial interventions [2]. (Zhang et al. 2017)

They detail China's promotion of intelligent manufacturing that is the focus for a new engine of economic growth examining the different approaches to modes of intelligent manufacturing including discrete and process intelligent manufacturing, networked collaborative manufacturing, mass customization and remote operation and maintenance. Yao et al. (2017: 311) provide a picture of the evolution of smart manufacturing (SM) through AI as a new version of intelligent manufacturing 'reflecting the magnitude and impact of smart technologies such the Internet of Things, Cloud Computing, Cyber-Physical Systems and Big Data on Industry 4.0'. As they go on to explain the 'Made in China 2025 Strategy' resembles the German model:

> The term "Industry 4.0" originates from the high-tech program of the German government, which derives from "smart factories" [40]. Following the first Industrial Revolution "Mechanization", the second "Mass production", and the third "Automation", Industry 4.0 emerges through the utilization of CPS, IoT and IoS [41, 42]. (Yao et al. 2017: 315)

What this transformation signals is the end of labour as a factor of production, something foreseen by Marx. Not just the end of the working class as an aspect of the industrial age but the end of labour per se, and society and politics based on labour.

This observation noted by Marx has been systematically commented upon ever since in a range of publications from theoretical and empirical sociologists who have analysed and sought responses to the problems of 'the end of work' or 'the future of work.' (see Manyika 2017) these twin discourses record the anxieties not only of sociologists but also politicians and policy wonks who foresee disastrous social

consequences based on technological unemployment looming. If this scenario is anything like being correct it will permanently change the game plan for education: what is the aim of education in the era of intelligent and smart manufacturing? In a workless industrial society, what are the possibilities for education in this situation? Education will need to radically alter to cope with this change, especially when the link between education and labour is broken once and for all.

Gorz and Steigler

In *Farewell to the Working Class*, Gorz (1982), the philosopher of work, focused on the historical emergence of work—the so-called 'invention of labour'—as a specific set of practices that came about with the advent of industrial capitalism. Breaking from his earlier Marxism, he focused on the denaturalization of labour, defining it as irremediably negative and alienating, to suggest that autonomy and the full development of human capacities can only be realized *beyond* work, in the revolutionary potential of the 'non-work class'. *Farewell to the Working Class* is a critique of the revolutionary role attributed to the proletariat. In Gorz's post-Marxism analysis work can no longer be considered the essence of human beings: it's a modern invention nursed in the cradle of modern industrial society where it became a 'purely functional activity, separate from life, disconnected from culture, torn from the fabric of human existence' (Gorz 1985: 39). The economic rationalization of labour under industrial capitalism was a subversion of the way of life, social values and relations and relationships to nature that had previously existed. Work ceased to be part of the culture; subjectivity became standardized. We could talk here also of Taylorism, of quantitative measurement, of economic rationality. The arguments have been made; the data has been collected. But Gorz's theory proposed in the 1980s remains weak in terms of analysis. While he draws a contrast with pre-capitalist societies and proposes a post-work era, his analysis does not really forecast or unpack cybernetic capitalism or the influence of the adoption of intelligent systems. While it is useful to investigate the historicity of work or work as a historical category, it is also necessary to go further to investigate the world system consequences of intelligent capitalism, something that only became obvious and important after Gorz's passing. Even more important, a future orientation is required that investigates the future of work based on an understanding of the long-term consequences of automation for labour and the future of the working class.

Philosopher Bernard Stiegler, perhaps, comes closest to providing such an analysis. Steigler founded the Institut de recherche et d'innovation (IRI) (2018)[2] in 2006

[2] 'IRI primarily explores the field of digital studies, in the sense of a new «organology of knowledge» appearing with the digital, which requires specific studies and concepts, and which shifts the whole contemporary episteme (as defined by Michel Foucault). More precisely, the institute investigates the field of cultural and cognitive technologies from a digital humanities point of view, which at IRI is considered to be a specific sector of digital studies. IRI thus aims at participating in the development of new forms, devices and technologies: to address the public; to facilitate contributions

to research the economic impact of digital technology and culture. His *Technics and Time* series (Vols. 1–3, Stiegler 1998, 2009, 2010) established him as an important philosopher of technology based on the argument that philosophy has largely ignored technics and that is essential a form of memory constitutive of human temporality. Technics is the horizon of all future to come and 'hominization' can never be separated from 'technicization'. As Wambacq et al. (2016) write as an introduction to an interview with Stiegler:

> For the last decade, Stiegler has pursued a 'pharmacological' approach that extends the reading of the *pharmakon* [Ed. 'remedy, poison, and scapegoat'] to every artefact. The fundamental philosophico-political concept utilized in that approach has been 'proletarianization': whether it is the inscription of speech in writing, the inscription of the gestures of the hand in the machines of the industrial revolution, or the inscription of the sensible in the audiovisual technologies of consumerist capitalism, all of these represent pharmacological stages that each time inaugurate a new tendency towards the loss of knowledge. In the latter case, it is the industrial exploitation of this tendency that forms the heart of consumer capitalism. (Wambacq et al. 2016: 2).

In his latest work *Automatic Society* Stiegler (2017), as his publisher's book description indicates

> advocates a radical solution to the crisis posed by automation and consumer capitalism more generally. He calls for a decoupling of the concept of 'labour' (meaningful, intellectual participation) from 'employment' (dehumanizing, banal work), with the ultimate aim of eradicating 'employment' altogether. By doing so, new and alternative economic models will arise, where individuals are no longer simply mined for labour, but also actively produce what they consume. (Stiegler, 2017)

In a departure from philosophical tradition that opposes autonomy and automatization, as Nony (2015) notes, Stiegler positions automatization at the core of biological, social, and technical forms of life.

> Responding to the rise of the digital—as the increasing automatization of processes of selection through computational means—Stiegler's project challenges us to recognize contemporary life as automatic. This shift in approach inevitably recalibrates the ontogenetic grounds of contemporary culture, and necessitates a reconsideration of sociocultural practices from the standpoint of the digital modes of algorithmic existence that are enacted within our midst. (Nony 2015)

Stiegler (2015: 130) suggests that 'The Anthropocene era is that of industrial capitalism, an era in which calculation prevails over every other criteria of decision-making, and where algorithmic and mechanical becoming is concretized and materialized as logical automation and automatism, thereby constituting the advent of nihilism, as computational society becomes an automatic and remotely controlled society'. As Oliver (2017) explains 'the ideology accompanying automatization is

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and collaborative critique; to provide solutions for editorial and social interaction in the domains of culture and knowledge. To achieve this, IRI both theorize and formalize the relevant technologies and the social practices they induce, as well as develop contributive applications, especially in and around the cultural, research and education domains, but also more generally as technologies for amateurs.' (IRI 2018)

utterly nihilistic because it systematically prevents the employment of reason and critique, particularly in a collective form, which is essential to distinguish between mindless adjustment to new technology (which is happening at present) and the question, how to "adopt" or appropriate it'. Stiegler (2015: 137) argues that the digital infrastructure set in motion with the Internet in 1993 supports the data economy and constitutes the most recent epoch of the Anthropocene. This infrastructure 'can and must be inverted into a neganthropic infrastructure founded on hermeneutic digital technology in the service of dis-automatization, that is, based on collective investment of the productivity gains derived from automatization in a culture of knowing how to do, live and think'. We are rapidly evolving into a hyper-control society founded on mobile devices such as the smartphone and other smart devices (smart home, smart city) which is a kind of smartification based on algorithmic regulation, a form of algorithmic governmentality (Rouvroy and Berns 2011).

The nihilistic impulse of the data economy can only be reversed through the 'battle for intelligence' inherent in the notion of critical thinking that raises its profile during the Enlightenment. In the age of digitization, or indeed the age of the postdigital reason (Peters and Jandrić 2018; Peters and Besley 2019; Jandrić 2019), 'we are increasingly no longer in a world where digital technology and media is separate, virtual, "other" to a 'natural' human and social life' (Jandrić et al. 2018: 893). Therefore, we are obliged to rethink education, work and the relationships between them—and up to the very foundations of these concepts. According to McKenzie Wark, 'The owl of Minerva flies at dusk. Concepts always grasp what is completed and past. So the first challenge for education is to think how to even describe the more abstract contours of the present in a way that is neither old wine in new bottles nor new wine in old bottles'. (in Jandrić 2017: 115) After 50 years of neoliberal education reforms, only now it slowly oriented away from industrial working culture to digital services, can we begin to imagine a postdigital education? Is there the possibility of resistance to the emergence of techno-being in the long term that harnesses the forces of information and biology?

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Chapter 3
The Lack of Work and the Contemporary University

Greg Thompson and Ian Cook

The Lack of Work

> In the former of these two controversies the charge brought against its studies was their remoteness from the occupations and duties of life, to which they are the formal introduction, or, in other words, their inutility…
>
> John Henry Newman (circa) 1852

Universities are in flux. Their historical commitments to disciplined thought, elite scholarship and ceremonies that conjure a medieval past no longer appear to be enough. We are told that it is all about market economics now. This leads to the question, which Lyotard posed in 1984, of what happens when previous narratives of legitimation of the university, in particular, 'the life of the spirit and/or the emancipation of humanity', no longer function as the purpose of the university (Lyotard 1984: 51). This chapter addresses the rise of particular discourses, practices and effects of instilling 'work' as the narrative of legitimation. There is something interesting about how the university exists in the mind of the policymaker, as 'cut-off' from the 'real world', as cloistered and disconnected spaces with rituals of knowledge and rites of passage that are no longer sufficient to address the social anxiety regarding jobs of the future and the role of intelligent machines. The contemporary university, to some extent, has been forced to 'open' due to external political and economic interventions. The Humboldtian ideal of the university that worked to confine the outside in order to address specific forms of student lack: lack of discipline, lack of knowledge, lack of insight and so on appears to be over. No longer institutions privileging (educational) discipline, contemporary universities have become busi-

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nesses, governed by the external anxieties of economics and work. We argue that in understanding the problem of work for the university, we uncover a shift in the mechanics of power within the institutions, from the dominant spatial machines of circulating power to temporal machines of modulating rhythms and beats.

Education has always been about lack, whether the kindergarten or the university. While machines of lack persist, the form or content of that lack, what Deleuze and Guattari (1983) call 'the investments of desire', is historically and/or socially produced. Thus, concern as to what educational subjects lack reveals much about the social and historical periods in which this concern manifests. For this chapter, changes to the work that universities do, and the emergence of work as the essential problem of university education that is evidenced in various measurements, such as work readiness, graduate employability and satisfaction, reveal a contemporary social anxiety about the future of work itself. This social anxiety has become a meme, expressed in the 'commonsense', and unprovable, catchphrase: 'the jobs of the future don't exist yet'. We are told the work of educational institutions is that of preparing graduates for these jobs of the future as 'agile workers' who can fit into changing career and employment patterns. In this, as Peters, Jandrić, and Hayes pointed out, education is being asked to 'resolve the problem of technological unemployment' that 'is a political construction' (Peters et al. 2019: 251). This social anxiety informs the reorganisation of the work that universities do, leading those responsible for managing, funding and regulating universities to become intensely interested in devaluing the university education they themselves received and promoting teaching and learning efficiencies achieved through technological innovations.

Taken together, this new content of lack within universities is radically reshaping what the university is and can do and indeed, what counts as an education. Peters, Jandrić, and Hayes call this new form educationalisation (2019). This breakdown of the institution is desired, so we need to understand the social machines of desire (that is, the investment of desire) on the parts of those making decisions to create a university form/experience unlike the one in which they succeeded. The emerging precariousness or precarity of academics emerges from the same investment of desire that brings us digital or online teaching, learning analytics and the replacement of discipline-based units with courses on how to be an agile (self) entrepreneur. Work is the business of the new university. It suits the narratives that university senior executives have come to accept as speaking their truth. Furthermore, in the sections that follow, we probe a somewhat forgotten relationship in critical thought, that between time, value and work (Lingis 1998).

This chapter begins with the argument that society has changed from one of the disciplines to one of the controls through the emergence of new temporal machines that overlay disciplinary institutions. It then focuses on work in the university, attending to the shifting patterns of work done in the university and their relation to the emergence of a different ordering of work within the university. Using Australia as an example of international processes, the chapter uses evidence gathered and new metrics developed that indicate a restructuring of work in the university and the intensification of the demand to work differently as a new moral imperative that exemplifies this temporal power. Third, we will extend the argument by positing that

one manifestation of this temporal power can be seen as creating new forms of lack within university graduates. Finally, the chapter will conclude by engaging with the rise of the administrative class within the university.

The Outside as a Temporal Phenomena

Universities (indeed, all social institutions) find themselves in a new organisation of the social. While there is something *fin de siècle* about an impulse to herald the coming of a new form of society on the parts of theorists writing towards the end of the twentieth century, such as Debord's (1998) spectacular society, Bauman's (2000) liquid modern or Rosa's (2013) accelerating society, what's important is that each of them noted that the social machine was functioning in new ways. While each theory operates differently, what they share is their symptomatology that we are in the midst of a new form of social organisation that old lenses can no longer describe. Orienting this chapter is Deleuze's notion of the control society that argues the disciplinary power that had previously organised social institutions was slowly disappearing after World War II. The spatialising discipline was being replaced by 'ultrarapid forms of apparently freefloating control' (Deleuze 1995a: 178). The crucial difference, for Deleuze, was that 'control is short-term and rapidly shifting, but at the same time continuous and unbounded, whereas discipline was long-term, infinite, and discontinuous' (Deleuze 1995a: 181).

In an interview with Antoni Negri outlining the control society, Deleuze argued that 'each kind of society corresponds to a particular kind of machine-with simple mechanical machines corresponding to sovereign societies, thermodynamic machines to disciplinary societies, cybernetic machines and computers to control societies' (Deleuze 1995b: 175). This analytic, evolving as it does from Foucault's theorisation of espistemes, posits that the social institutions that come into existence adapt to those fundamental assumptions; 'the machines don't explain anything, you have to analyse the collective apparatuses of which the machines are just one component' (Deleuze 1995b: 175). While it is not possible to do justice to the history of the evolving university in this chapter, two forms of the university appear to correspond to the sovereign and disciplinary epistemes. If the university is a machine (or a particular technological solution to an epistemic problem) then the form of the university corresponds to the social apparatus at work in its time. Thus, we might argue for a correspondence between the sovereign episteme and the ecclesiastical university of Bologna or Padua typified by sovereign recognition of the association (the *universitas*) that gradually led to a form of Papal overlordship (Grendler 2017).

Correspondingly, this ecclesiastical form was placed under strain by the newer, disciplinary episteme that saw two competing university forms; first, that of the French system typified by 'severe, often military, discipline, strictly organised and controlled by an enlightened despotism that governed to the last detail the curriculum, the awarding of degrees, the conformity of views held concerning official doctrines, and even personal habits such as the ban on the wearing of beards' (Rüegg 2004:

2–3). The second, commonly called the Humboldt University was typified by a sovereign form, the Humboltian university as a more secular institution for which 'the function of the university was not to pass on recognised and directly usable knowledge such as the schools and colleges did, but rather to demonstrate how this knowledge is discovered, "to stimulate the idea of science in the minds of the students, to encourage them to take account of the fundamental laws of science in all their thinking"' (Rüegg 2004: 5).

While the French and Prussian models gradually colonised Europe, there is little doubt that the contemporary university is more of a business, or corporation, than Humboldt could have tolerated. As Peters has remarked in thinking about the form of the contemporary university; 'The game has changed permanently. Now universities are 'engines of innovation' for 'fast capitalism' dealing in 'fast knowledge', 'fast publishing' and 'fast teaching' (e.g. massive open online courses (MOOCs)) where 'knowledge' (confused with information) is seen as having a rapidly decreasing shelf-life' (2014: 10).

This summation captures an element of the control society as it pertains to social institutions. In this new collective apparatus, institutions 'no longer operate by confining people but through continuous control and instant communication' (Deleuze 1995b: 174). For Deleuze, this required new analyses of the social investments of desire that lead to '[n]ew kinds of punishment, education, healthcare'. It is these new 'kinds of punishment, education, healthcare' that 'are being stealthily introduced' and we argue first that these are visible in the contemporary university and second, that these emerge as a result of a new politics of lack at work within collective, or social, apparatus.

In education institutions, such as schools and universities, control is often expressed through a specific mode of assessment, in the move to continuing assessment 'that operates through what Deleuze refers to as the learner's 'strange craving to be "motivated"' (1995a: 182). In other words, the institution does not form an apparatus of uninterrupted examination; rather, it is the self that is continuously and surreptitiously induced to generate data that is stored and connected, integrated and made sense of algorithmically. A key feature of control societies is that each individual's recorded and noticed performances can never be finalised. While in disciplinary logics 'you were always starting all over again… in control societies you never finish anything' (Deleuze 1995a: 179). This articulation of endless, ultrarapid forms of control, which rely on the incentives generated through (increasingly digitised) continuous assessment, is an important tactic of a 'logistics of engagement' in which the system's logic is to keep people moving, and accelerate (intensify) where possible through their engagement with the technology (Thompson and Cook 2017a, b). As Lazzarato (2006: 176) suggests, this is not to create some inward looking disciplinary affect, as institutions of control operate to 'confine the outside' as a means of codifying repetition. 'We know that the school, the factory, the hospital and the barracks are *dispositifs* to confine multiplicity. But more fundamentally, Deleuze says, that which is confined is the *outside*. What is confined is the virtual, the power of metamorphosis, becoming' (Lazzarato 2006: 175). The most obvious example is of the use of digital tools designed to affect maximum engagement, through adaptive systems that

aspire to re-motivate the waning and further motivate the already motivated. And in these new forms of adaptive governance, the rules require 'technologies of action at a distance… for the capture of multiplicity in an open space' (Lazzarato 2006: 183).

Anxiety associated with manifesting sufficient engagement becomes a principal form of regulation in the societies of control, as it assumes a form of measureable, codeable representation of what it is to engage (Thompson and Cook 2017a). This is always a reductive categorization of value. Whereas, moulds dominate disciplinary power (such as static enclosures/institutions in which individuals are formed), power in societies of control is modulatory; functioning as 'a self-transmuting molding continually changing from one moment to the next, or like a sieve whose mesh varies from one point to another' (Deleuze 1995a: 179). In this, new subjectivities are created and new 'orders' attached to seemingly benign words like 'engagement', 'commitment' or 'work'.

> The societies of control generate their own technologies and processes of subjectivation, which are noticeably different from the technologies and processes of subjectivation in disciplinary societies. The (social and technological) machine of expression not only cannot be reduced to ideology, as Marxism and political economy wish to do, but it becomes more and more the strategic locus of the process of constitution of the social world. It is in it and through it that the event actualises itself in the souls and effectuates itself in bodies… The institutions of the societies of control are thus characterised by the use of the technologies of acting at a distance. (Lazzarato 2006: 180)

The subjectivation produced in all disciplinary social institutions undergoes a change and universities are no exception.

Work in the University

The first manifestation of the (temporal) opening of the university is a change in the composition of workers within the university. Patterns of employment in Australian universities have changed significantly. In 2017, university employment increased to 106,287 Full-Time Equivalent (FTE) positions, up from 86,624 FTE in 2008 (with 'limited term', or precarious positions, increasing from 31,646 FTE to 38,671 FTE in 2017) (Department of Education and Training 2018). Importantly, in 2016, more than half (57%) of the Full-time and Fractional Full-time staff employed at Australian universities were employed in roles other than teaching, research or teaching and research. In addition, 2010 superannuation data suggested that 'there were 67,000 casually employed persons in academic roles in 2010 (May, 2011), outnumbering those employed on a continuing or fixed-term basis' (Andrews et al. 2016: 13). Other research suggests that employees on casual contracts do more than 50% of the teaching in Australian universities (Ryan et al. 2013). This change was accompanied by an increase in the student population. 1,292,440 students were enrolled in both undergraduate courses and postgraduate courses in 2017, up from 899,021 in 2007.

What we are seeing is that the work done in Australian universities is shifting; first away from tenured academic staff meeting students face to face in traditional

university pedagogies such as lectures and tutorials (Selwyn 2016), and subsequently towards more anxiety-producing precarious work (Brown et al. 2010; Loveday 2018). This shift towards both flexible (or online) learning and precarity is a considered choice. Administrators hope online learning will improve access and engagement while providing a cost dividend. Precarious labour exists because it is desired both by university senior executives and by the precarious academics themselves. There is 'cruel optimism' at work in these arrangements. Even as online learning creates the conditions for what Lyotard (1984) calls the end of the time of the professor, the other worker subjects, either the precarious academic or the university manager trying to act ethically, remain attached to an ideal of 'academic work', 'even though its presence threatens their well-being', because the attachment to these compromised conditions of possibility offers them some 'sense of what it means to keep on living on and to look forward to being in the world' (Berlant 2006: 21). This cruel optimism extends Lazzarato's critique of 'man (sic) in debt'. The precarious academic is always in debt to opportunity, and this debt is infinite, unpayable, and inexplicable' (Lazzarato 2015: 84).

To reiterate, the practice of academic teaching work is changing (Selwyn 2016). This situation is, for the most part, created by technological possibilities, such as their engagement with MOOCs, Blended Learning, Intelligent Tutoring Systems and other adaptive technologies pursued with great zeal by university senior executives. The student is no longer co-located with the academic teacher, lectures are recorded and (perhaps) watched online, and assignments are uploaded remotely and automatically checked for plagiarism. 'Educationalisation… is dialectically intertwined with "the effects of educationalising technologies"' (Peters et al. 2019: 245). Further, the (somewhat disappointing) reality of MOOCs held the promise that learners need no longer be bound to their (or any) specific institution, with many universities running online programmes that (are intended to) provide academic capital, such as avoiding plagiarism and referencing and essay writing skills. Like the student, whose learning materials are always available and who is encouraged to be a lifelong learner, the academic, whether tenured or precarious, is always subject to the technologies of action at a distance. E-mail, LMS and social media means that the academic is 'on', always available, always subject, and there can never be enough time to fulfil all that is expected, such that the academic is always in temporal deficit (indebted to time). Further, the omnipresent student survey of teaching is another aspect of the opening of university teaching. Despite considerable evidence demonstrating how unreliable these surveys are, how they discriminate based on gender and ethnicity and how invalid these are the measures of teaching quality (Braga et al. 2014), student surveys of teaching have become a high stakes affair for individual academics (in performance review and promotion) and for institutions, as governments invest in publishing league tables that compare 'teaching quality'.

Further, the demand is growing for the teaching of non-disciplinary courses, functioning under a variety of labels ('breadth', 'capstone', 'signature', 'transdisciplinary' or 'work integrated learning') in undergraduate degrees. So even discipline-based teaching is being opened. Rather than being oriented to students engaging with disciplinary knowledge, which reflects what a graduate is expected to know in

order to graduate with deep understanding of a specific discipline, these units prepare students to be creative and agile, able to respond to a working future that, as will be discussed below, does not exist but about which there is much anxiety.

In addition, metrics that measure, or value, research is changing to open universities to the outside. In 2015, the Australian Government reacted to criticism that not enough research benefitted 'end-users' by introducing 'a framework for a national assessment of university research engagement and impact' outlined in the National Innovation and Science Agenda (NISA). One of NISAs four 'pillars' is to 'change funding incentives so that more university funding is allocated to research that is done in partnership with industry'. This lead to the development of new metrics to measure the 'impact' that research has had on end users, often presented amorphously as 'industry'. In 2018, all Australian universities were required to report all of their research outputs within predetermined categories, and then submit 'impact studies' that demonstrate the 'contribution that research makes to the economy, society, environment and culture beyond the contribution to academic research' (Australian Research Council 2017: 3).

Whilst this is Australian data, there is much evidence that suggests that the changing 'sense; of work in universities is common in many countries around the world (Courtois and O'Keefe 2015; Ivancheva 2015). University administrators, especially senior executives, are enmeshed in an international education reform industry that spawns a consultocracy (see Gunter et al. 2015) reproducing the same policy advice for all universities. The reorientation of the work of universities across the world is driven by internal management disconnected from the inner workings of the university they manage but connected to those outside the university. Thus, there is 'growing evidence that management is becoming a discrete function within universities' with managers 'largely divorced from day-to-day academic work, leading to an increased separation of management and frontline academic activity […] The result has been that management has emerged as a 'distinctive social group' with its own interests' (Shepherd 2017: 9). These internal management elites are connected, on the outside, to an international policy advice network that means that the same advice/commodity associated with education reform is reproduced across the world. The case studies of university reform in Italy, New Zealand, Serbia and South Africa revealed 'vastly different leadership structures and organisational hierarchies operating in different national (and supranational) political and policy environments that nonetheless all seem … to … attune themselves to external markets of skills and knowledge' (Boyer 2010: 75). In addition, and by way of enhancing the outsideness of university administration, this 'small group from amongst the ranks of senior managers and academics… broker[s] its own new relationship to the external business class' (Rata 2010: 77).

In opening to this external business class on the parts of university administrators, 'a new entrepreneurial and managerial spirit has emerged that has resulted in the implementation of market-driven rules and competition' (Allmer 2018: 1–2), which enables and justifies control. In the context of globalisation, this means 'that educational institutions nowadays aim to respond to market demands on an international level' (Allmer 2018: 2). Institutions of higher education now 'compete on a global

market for international students' leadings critics to refer to 'academic capitalism', the 'corporate university' and 'Uber.edu'. These structural transformations have had an effect on the working conditions, practices and relations of subjects and result in 'the intensification and extension of work, the blurring of work and free time, casualisation, precariousness, self-exploitation and self-marketing' (Allmer 2018: 2).

Unlike much of the research that attends to experiences of anxious precarity and the changing nature of work in the contemporary university, however, we contend that the change in work in universities is not the result of a mechanical, or technological, determinism. Rather, following Deleuze, the technological innovations that are disrupting the university 'express the social forms capable of producing them and making use of them… control societies function with a third generation of machines, with information technology and computers' (Deleuze 1995a: 180). Thus, the growth of outside-oriented administration and the introduction of metrics, accountability and teaching machines that are proliferating in the university do not produce, what we call, discourses of lack, they explain the forms that those social discourses take. And, as we have argued previously (Thompson and Cook 2017b), discipline is not erased by control, rather it is overlaid, or superposed. In other words, the spatial forms of the normalising gaze and the examination remain, but they are overlaid by new temporal urgencies, rhythms and speeds or velocities associated with work in universities. An inside/outside operates in which an administration 'knows' the teaching and research staff from within through metrics that are derived from without.

While disciplinary societies function through power as space, control societies function through the power as time. The problem, in short, is that the spaces (vacuoles) of work and the lack associated with education have become overlaid with temporal forces such that new intensifications emerge. This is not to say that morality and discipline are not necessary, morality insists that the university worker anxiously gives their all and repays (temporal) debt through manifesting the correct data, while discipline continues through possessing the appropriate credentials, accepting individual responsibilisation and comportment. The new work order requires individuals who will open themselves to continuous monitoring with respect to performance, provide assurances as to the effort they will put into developing the new skills required for teaching in a time of digital education platforms, provide leadership when it comes to administrative responsibilities (which often includes selling their institutions to potential buyers), win research grants (or be setting themselves to win such grants) and produce research outputs in journals with high impact factors. This openness to the outside extends to being regulated by outside expertise, such as being told what to teach or research by 'industry', or accept leadership from administrators whose skills were either gained in 'industry' or who abandon academic pursuits and whose decision-making is driven by market principles. For academics, these decisions are invariably a series of 'best bets' in the hope of carving out periods of time where the old sense of academic work remains possible.

Social Machines, Lack and the Investment of Desire

One crucial driver of the reform of universities and the changes the work of universities are lack and desire. Education and lack have always been coupled. If we return to the brief sketch of the ecclesiastical university mentioned earlier, it is quite simple to see that the lack identified, and responded to, is that of virtue or godliness on the part of the student particularly, and society in general. In the Humboldtian University, the lack is one of the correct scientific, or Enlightenment, sensibility coexisting with a certain personal discipline that extends from the bureaucratic state. We cannot stress enough that the Humboldtian professor remains a civil servant whose salary is paid by the state (Rüegg 2004). If we see both ecclesiastical and disciplinary lack as particular forms of a more general lack machine, or abstract machine, then each epoch of the university presents us with the coordinates for the understanding of collective, or social, concerns. The contemporary university, responding to the control society, operates differently because of the centrality of two new (social) machines of lack. One is obvious, it is the machine that produces a new discourse of work associated with the ever-deepening integration of digital technologies in production processes. The second machine is less obvious. It is the machine of university administration, which, while originating from amongst the ranks of those who teach in universities, has acquired an autonomy from the production of education commonly associated with teaching and research. It is the latter machine that works to produce (and sell) the lack of universities, but it only works because it is coupled with the discourse-producing machine of the new economy of work.

The desire to buy into programmes of reform that address the lack of the university, the commodification associated with the desire to reform, is not, then, some natural event. As Deleuze and Guattari have argued, lack is always produced. 'Lack is created, planned, and organized in and through social production…. It is never primary; production is never organized on the basis of a pre-existing need or lack' (Deleuze and Guattari 1983: 28). Lack (and therefore desire) do not precede production, they follow it. But, while capitalism commodifies lack, 'there is no society that does not arrange lack in its midst, by variable means peculiar to it' (Deleuze and Guattari 1983: 342). In capitalism, the production of lack simply takes a particular form. 'It is lack that infiltrates itself, creates empty spaces or vacuoles, and propagates itself in accordance with the organisation of an already existing organisation of production. The deliberate creation of lack as a function of market economy is the art of a dominant class' (Deleuze and Guattari 1983: 28).

A desire to change the university, invariably expressed by governments and consultancy groups, is a function of a lack produced by those in dominant positions. It is no accident that Universities UK was a co-sponsor of the *Future Fit* report, which was concerned with 'preparing graduates for the world of work'. Similarly, the consultants Ernst & Young produced a report for Australian universities arguing that because '[t]echnology disruption is affecting the nature of employment and employability' universities will have to adapt 'to remain relevant for the future of work' (Ernst and Young 2018). The University Industry Innovation Network published

'The Future of Universities Thought Book' that talked to 'present or future "game-changers" and "thought-leaders"' to develop a manifesto for the 'Future-Oriented University' (Davey et al. 2018). Superficially, what universities lack, it seems, is the future, and the only way to reclaim it is to innovate to save it (and, for the academics, to avoid unemployment).

As much as social institutions are produced through collective desires, they also produce desire, as 'desire produces reality, or stated another way, desiring production is one and the same thing as social production' (Deleuze and Guattari 1983: 30). For 'the truth of the matter is that social production is purely and simply desiring-production itself under determinate conditions' (Deleuze and Guattari 1983: 29). The fantasy of the university as outlined in the previous reports in synch with the (new) times is an effect of social processes, and not the peculiar fantasy of disconnected administrators. The desire for the synchronised university is not the product of 'fantasy-machines or dream-machines… [that] can be distinguished from technical and social machines'. Rather, it derives 'from the identical nature of the two sorts of machines in any given set of circumstances'. For 'fantasy is never individual: it is group fantasy—as institutional analysis has successfully demonstrated' (Deleuze and Guattari 1983: 30).

And, if any social machines can be understood to have lack and desire (and fantasy) at their core, they are educational machines because they have the 'the lacking student' as their object/subject. Education is changed, and it must project lack onto the student body, which can then be enhanced or improved. In previous times, and according to other productive machines, the figure of the graduate prepared for the work of his/her times was different. Any lack on behalf of the student was his or hers alone. But in the contemporary university, the lack does not and cannot only reside in the student, the service economy requires that every educated graduate must be able to be taken up by other connected social machines such as governments, bureaucracies, employer groups and industries to satisfy economic logics. The economic fantasy of the 'the no longer lacking graduate' is turned back on the university, as the graduate prepared for the work of our times, and as an avatar of what is wrong with the university, that is, its lack.

The Lack of Universities

The narrative of disappearing jobs is fundamental to the reform of university work. It stems, for us, from a (new) production of lack as the university teacher's failure to equip students for work in our times. In a report on 'The Future of Jobs and Jobs Training' Rainie and Anderson (2017: 2) declared that 'Machines are eating humans' jobs talents'. This machinic appetite produces anxiety as the university graduate is taken to fear being left behind, not unemployed as such but unworkable, as 'programmed devices—many of them smart, autonomous systems—continue their march into workplaces' (Rainie and Anderson 2017: 2). This paranoia regarding work has led to the mantra that graduates must be trained for jobs that don't exist yet and

may not persist, which serves as means to redirect attention towards a Silicon Valley inspired utopia that has much to do with capture by a particular form of corporatism. This anxiety is an extension of the logic presented by many thinkers, of whom Marx is a useful example.

The traditional Marxist anxiety fixates on the role of the machine in determining the form of, and then replacing (as fixed capital), human labour. First, 'the worker's activity… is determined and regulated on all sides by the movement of the machinery' (Marx 1993: 693). Then human work is transformed into machinery. 'The accumulation of knowledge and of skill, of the general productive forces of the social brain, is thus absorbed into capital, as opposed to labour, and hence appears as an attribute of capital, and more specifically of fixed capital, in so far as it enters into the production process as a means of production proper' (Marx 1993: 694). The crucial difference between the new work-eating machines and preceding ones is that labour no longer 'appears… as a conscious organ, scattered among the individual living workers at numerous points of the mechanical system' (Marx 1993: 693). In short, machines do thinking work and do not need a human conscious organ, or need fewer of them and only for a time.

This, according to some, does not mean that there is nothing for people to do. Just as jobs are being eaten and crushed by the marching machine, they argue, so too is work being created. 'The basic fact is that technology eliminates jobs, not work'. (Bowen as quoted in Autor 2015: 4. See also Wajcman 2017; Peters 2017). One of the common features across these new forms of work is that it is precarious and episodic, appearing and disappearing according to what is needed at the time. As Friedman has suggested, the new form of work is part of a time without jobs. In this economy, workers are 'no longer employed in 'jobs' with a long-term connection with a company, a job ladder, and mutual interest in the well-being of both the company and the worker. Instead, they are hired under 'flexible' arrangements, as 'independent contractors' or 'consultants,' working only to complete a particular task or for a defined time' (Friedman 2014: 171).

Symmetrical/Repeated Precarity

A powerful symmetry appears in the context of a university that has come to mirror business. Universities have internalised the external message—graduates are to be trained to be agile for precarious work that does not exist yet by precarious academics who are to enthusiastically embrace the changing conditions of digital work and overcome their traditional (enclosed) lack of agility, flexibility and productivity. And in both cases, graduates and academics are subordinated to an ever-growing and increasingly mechanical administrative apparatus. Contemporary university administrators, who were trained in and understand through a disciplinary mentality continue, as Deleuze suggested, to demand reforms of others trained in the same mentality. But there is no saving the disciplinary university. 'The appropriate ministers have constantly been announcing supposedly appropriate reforms… but everyone knows

these institutions are in more or less terminal decline' (Deleuze 1995a: 178). In the short term, though the administration is endlessly required and administrative work created within the university. At the same time, academic teaching jobs, like all jobs, can be dispensed with or converted into casualised and highly precarious (teaching) work. With its final realisation being the university business that functions temporally and not spatially, as the placement of teaching and learning with digital forms of continual assessment is 'the surest way of turning education into a business' (Deleuze 1995a: 179).

Both graduates and academics will find themselves on the outside and governed by rhythms or temporalities that reflect the effects of machines on work and business—inducing a temporality of precarity. Not only, as we noted above, do workers never finish anything in a control society, they do so in the same way (according to the same time signature). 'In control societies you never finish anything—business, training, and military service being coexisting metastable states of a single modulation, a sort of universal transmutation' (Deleuze 1995a: 179). The ongoing monitoring (measurement) and putative adjustment (via a setting of personal targets or goals and determining rewards, which might include getting more work) of each academic is crucial to controlling the academic's time. As in all businesses, administrators will increasingly 'strive to introduce a deeper level of modulation into all wages, bringing them into a state of constant metastability punctuated by ludicrous challenges, competitions, and seminars' (Deleuze 1995a: 179). To produce control within the business of the university requires introducing and overseeing 'an inexorable rivalry presented as healthy competition, a wonderful motivation that sets individuals against one another and sets itself up in each of them, dividing each within himself' (Deleuze 1995a: 179). For the person subjected to and through control 'undulates, moving among a continuous range of different orbits' (Deleuze 1995a: 180) and this network has to be administered (at least for the time being—in the end, a machine can do it).

The need to ensure that market forces are allowed into the university so as to reorganise teaching and learning in terms of the precarity that governs the life of other workers, and which requires administrators who provide ongoing administration and who seek to organise the university so that it sells. 'Marketing is now the instrument of social control and produces the arrogant breed who are our masters' (Deleuze 1995a: 181). And the most powerful marketing tool of the university that opens to the outside is to induce a desire for endless training through a social machine that produces lack. 'Many young people have a strange craving to be "motivated," they're always asking for special courses and continuing education' (Deleuze 1995a: 182).

If, as Deleuze (1995a: 181) argues, work in control societies is turned towards 'metaproduction', or a system where 'what it seeks to sell is services, and what it seeks to buy is activities', then the question remains how the reconstitution of the university as a business, or corporation, changes the workforce itself. In a control society, the configuration of ultrarapid, continuous assessment and performance creates institutions 'where the only people left are administrators' and whose orientation is always towards competition and comparison interested in micro- and macro-forms of marketing where what is at stake is the investments among the workforce of the

correct desires (1995a: 181). This is, essentially, a form of affective management, the disciplinary function of the administrator of controlling space and confining the work of the institution (such as timetables, governance, codes of conduct) has been overlaid by the management of dispositions, the exhortation to be always (anxiously) open and available to the digital tools of metric comparison and performative communication. There is some relation here to Lyotard's (1984: xxiv) notion of the university as a commensurable institution, where the performative terror that comes from the outside is 'be operational (that is, commensurable) or disappear'. And this, of course, is a reconfiguration of the temporal, time as a shortage (there is not enough time) becomes time as a series of multiple and competing rhythms, always flowing, that the worker is encouraged to 'surf'. And the crucial attribute of activities is that, as doings, they occur and can be measured in time. Gerunds are always primarily temporal.

Conclusion

The university, perhaps from the emergence (in modernity) of the education expert, has always operated through a doubled lack: the lack in students and the lack of the university in educating students. Whereas once these lacks were addressed in an enclosed way (sometimes via internal processes of accounting, sometimes by just keeping it in-house), these lacks are now being addressed in an unenclosed way (via exposure to ongoing external processes of accounting and management against a background of precarity). The latter involves: the appointment of academic-refusing administrators (often by way of the appointment of outside expert managers—not all of whom have worked at universities before), the reduction in the numbers of tenured staff, increases in the number of short-term appointments, national university regulation for teaching quality and impact, generic student surveys, standardised curricula, in increasingly precarious work. In these ways, the university is being brought into line, as a business, with processes that function externally as part of the emergence of a control society and academics come to share the anxiety of all other precarious workers.

Universities like all former spaces of enclosure that have become businesses are no longer differentiated, or operate through differentiated and separated spaces and are being enfolded in the temporality of the control society. The business of educating students for jobs that don't exist yet creates an environment within the university in which jobs don't exist in any final way. Ongoing surveillance for impact means that there is no rest and only constant movement to escape unemployment, which is the end of the spatiality of university work and the subject becoming-temporal. Fitting students for work that will come and go—the gig economy—and, for increasing numbers, no job just endless work to pay off debts means changing the university to replicate precisely the same conditions that function on the outside.

To return to one of our contentions—the lack that is emerging and manifesting in the contemporary university is a lack of time (as value). If the time signature of

the disciplinary society is mechanical (clock-time regulating work patterns such as shift work) then the time signature of the digital is through the nanosecond (made up of imperceptible beats). Time is, for Deleuze, essentially about subjectivity, so one point of interest is how the lack of the university is impacting the academic subject. As the most obvious manifestation, the precarious academic is subject to continuous assessment in metrics not of their making, for decreasing returns, in multiple ever-shrinking contract cycles. This, of course, is one way of understanding the gig economy, where agileness and innovation hide the precarious academic as the new hero of the future of the university. Precariousness in the general workforce is being mirrored by precariousness in the university workforce—as a function of the emergence of a control society in which universities are to address their lack in the (newly) required way. And, there is no better way to achieve this end than through the functioning of social machines that produce lack and elicit a university education fully opened to a future constituted through work generated by digital technologies. A desire that can only be addressed through the tireless (and thankless) efforts of ever more administrators, exhorting the worker to embrace the 'logic of maximum performance' (Lyotard 1984: xxiv). To satisfy, of course, the soul of the corporate university.

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Chapter 4
On Autonomy and the Technological Abolition of Academic Labour

Richard Hall

Introduction

Across the global North, academic labour is under acute stress, manifested through individual and collective narratives of ill health and ill being, many of which pivot around anxiety (Hall 2017). In these emergent narratives, the re-engineering of academic practices, in the form of administration, scholarship and research, and teaching has been shaped by discourses of efficiency, entrepreneurship, excellence, impact and so on (Department for Education and Training (DET) 2016). These discourses spread like a form of metastasis through competition at the levels of the individual academic or student, the academic department and institutions (Office for Students (OfS) 2018). In the process of infecting academic labour with a competitive impulse that drives the production of new academic commodities and surpluses, overwork is normalised across the higher education (HE) sector.

This impulse to compete, shaped by an increasing obsession with global league tables, emerges from the subsumption of HE as a sector and individual institutions as competing businesses, under the capital relation (Hall and Bowles 2016). Here, the University is repurposed or re-engineered so that its activities, social relationships, cultures, supply chains and so on enable the production of commodities that can be exchanged. This changes the nature of the University, and of the labour, that takes place inside it. First, it becomes a locus for the production of value, which is rooted in the exploitation of labour power (Marx 2004). This demands the repurchasing of that labour power, through organisational development and technological innovation. Second, as surpluses, rents or exchange values emerge from the production of academic commodities and the re-engineering of academic labour, universities become embedded inside networks or chains of production. Here, they can be regarded as nodes in technology-rich associations of capitals. Third, these networks or associa-

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tions coalesce into a technological system that co-opts and reproduces social relationships for the production of value, and thereby forces academic labour to respond to global, social changes in production through a constant investment in its own human capital (McGettigan 2015).

For institutions, these changes are situated within a wider terrain of commodification, which is repurposing their practice. Whilst there has been some discussion about the complex nature of the public or social good of HE (Marginson 2016), increasingly, in the global North, the public value of this sector is governed by finance capital and the dictates of the market. For both academics and the institutions in which they work, there is a need to enrich the value of the commodities that they produce. This entails a focus upon increasing the technical composition of those commodities, in order to make their production more efficient, and to drive down labour costs (Marx 2004). Thus, there is a range of narratives about precarious or friable employment, in particular, amongst early career academics (CASA n.d.; Lorey 2017), and these also reflect intersectional injustices (Emejulu 2017; Gabriel and Tate 2017). However, precarity is amplified because institutions are increasingly focused upon the deployment of technological solutions to problems of workload management, attendance management, progression and retention of students, the delivery of teaching materials and assessments. For Dyer-Witheford (2015: 13), increased levels of precariousness of the class that must live by selling its labour is 'a condition raised to a new peak by global cybernetics'.

Thus, whilst education is increasingly sold as the pivot for social mobility (Department for Education (DfE) 2017), academic work demonstrates a disconnection with that promise, precisely because certain bodies are unable to progress through organisations (Ahmed 2012), and are not able to leverage the autonomy that corresponds to their experience and expertise. The imposition of new workload models, relations of production, and forces of production inside institutions and across HE generate new forms of proletarianisation. Where the status of academic labour is denied, both for staff and students, the alienated nature of that work is laid bare (Hall 2018).

It is on this basis that Marx (1974, 1991) and Marx and Engels (1998) analysed and described the increased estrangement and alienation of labourers from their work, and the possibility for its overcoming through a new form of social reproduction rooted in free time or autonomy (Gorz 1982). Here, technology is pivotal in widening that space for freedom or autonomy as opposed to the imposition of capitalist work as a form of heteronomy or necessity. Yet, as Marx argued (1993: 751), inside societies governed by the law of value, 'revolutions in technology and organisational development' catalyse 'the anarchy of production', precisely because capital rather than people become 'the supreme arbiter of social development and control' (Mészáros 2015: 44).

At issue then is how to overcome the schizophrenia that emerges from the disconnect between: first, capital's urgent desire to replace labour power with technology; and second, the reality that capital can only reproduce itself by extracting surplus value from the labour it embeds in commodities (Jappe 2016). This forces capital to develop production on an ever-expanding scale, and to push beyond or ignore its human or natural limits. In this chapter, I situate these contradictions inside capital's

subsumption of the University and in its relation to academic labour. This argument pivots around the revelation of the living death of competition, as a moment to struggle *against* the imposition of work, and *for* autonomy. As Marx (2004: 477) noted, competition and coercion reduce the individual 'to a partial operation', with a 'complete subjection to capital', such that the system continually imposes productivity through a specific, exploitative combination of humanity and technology. The question is whether, in the emerging contradictions of the relationship between academic labour and technology inside the University, another world is possible.

Capital and the University

Globally, the education sector of the economy is being re-engineered, such that *both* individual institutions and the networks inside which they are located, *and* the sector as a whole become productive of value. Value is a crucial component in understanding the re-engineering of HE in the name of productivity, financialisation, marketisation, impact and so on. Value emerges from the exploitation of labour, which is enhanced through the application of technology and forms of organisational development that enable cooperation across a social terrain. Such cooperation might take place inside institutions, or across distributed networks.

Thus, as labour is exploited, surplus value is extracted from the surplus labour time in which knowledge, skills and capacities can be embedded inside commodities. Surpluses can be developed by opening up new markets (geographically, or through the provision of new services into established communities), inside which all businesses compete for absolute surplus value, or by encouraging or enforcing overwork. However, the treadmill drive to maintain a competitive edge in a regulated, global market demands that institutions become more capital intensive, for instance, by investing in digital technologies that enable new forms of organisational development, through restructuring, new workload models and so on. The idea is to impose more work and higher levels of productivity across a fixed model of work time, such that the costs of labour and the time to produce and circulate specific commodities are reduced. Thus, as more constant capital or means of production (e.g. in terms of technology) are set in motion by an individual labourer, there is a pressure to economise on labour power (as a commodity) or to discover new markets in order to unlock relative surplus value (Marx 2004).

Competition drives a process of economising and making labour productive. This happens through the integration of the academic with technology, in order to unleash more means of production, or by forcing the academic to develop her own human capital (Haiven and Khasnabish 2014). As a result, businesses like universities are involved in an ever-expanding escalation of competition, as they search for surpluses. Here, technological and organisational innovation is critical in increasing the efficiency of course design, delivery or assessment, or of the production of research outcomes. Through such innovation, specific universities gain an advantage until the

innovation is diffused more generally. At this point time-based, productive advantage is lost because it is normalised, and the process begins again (Marx 1991).

This process of normalisation forces the average productivity of labour, represented in the value of specific commodities, to increase, either by overwork, through human capital development, or by transferring labour-based activities to technology. This tends towards the proletarianisation of academic work inside the University, and this is amplified through the financialised restructuring of teaching and research, rooted in debt-driven study, the issuance of bonds to support capital-intensive campus redevelopment, internationalisation strategies predicated upon commodity dumping in the global South, which moves towards the outsourcing of student support services, and so on (McGettigan 2013; McMillan Cottom 2016). This means that the University has little room for manoeuvre in resisting the enclosing logic of competition and in arguing for a socialised role for HE.

Thus, the social environment inside which the University is governed, regulated and financed cannot be shaped by humane mediations, and ideas of the public good. Instead, the University lacks the autonomy to resist second-order mediations of private property, commodity exchange and the division of labour, imposed by the desire of the financialised networks inside which it is embedded to extract value (Lapavitsas 2013). This is important because the University is locked into behaviours conditioned by its partnerships with hedge funds, technology providers, consultants, digital content providers, policymakers and so on. It is compelled to organise work in a highly cooperative, highly digitised manner, in order to maintain the agency and structure of the system of capital. Thus, we see the use of technology to drive private, academic property through the use of intellectual property law and copyright, by extracting rents from the use and reproduction of digital artefacts, in encouraging knowledge transfer, commercialisation and incubation, and so on (Wendling 2009). We also witness the commodification of specific academic knowledge and skills, so that these can be exchanged in the market, for instance, in the use of massive open online courses (MOOCs) (Hall 2015). Finally, technology reshapes the division of labour through platforms, or the so-called gig economy (Boyd 2017).

Hence, it has been possible for academic activists to redefine or re-describe the University, in its relation to society mediated by capital, as 'psychotic' (Sievers 2008), 'a stranger to power' (Derrida 2002), a space to be hospice as it dies (Andreotti et al. 2015) and an anxiety machine (Hall and Bowles 2016). The relationship between humans and technology is crucial in each of these redefinitions, and in reflecting upon the University as a disciplined/disciplinary space, which incorporates networks of technologies, algorithms and forms of cybernetic control, alongside expert knowledge, in order to redefine social relations of production (Dyer-Witheford 2015). The imposition of disciplinary technologies for workload and performance management, monitoring and surveillance, performance data and learning analytics, and so on imposes specific modes of behaviour that sustain the law of value against humanist knowledge production.

There is a final point to be made here about the relationship of socialised knowledge to the production of value, and the ways in which what Marx (1993) described as the 'general intellect' of society, which has been instantiated inside technologies

and forms of organisation such that they appear to have emerged from capital. As the knowledge, skills and capabilities of humans, including academic practices, are commodified and embedded inside machinery, codes, algorithms and so on, that which is humane is transferred into fixed capital, such that at the level of the system, capital itself can attempt to escape from its reliance upon labour power for its reproduction. In this process of extracting and recoding the general intellect as capital's own means of reproduction, the autonomy of the system is extended through automation that renders population surplus to requirements.

In the universities of the global North, this becomes more visible as work is made more precarious (Southwood 2017), as academics are forced to become micro-entrepreneurs of the self (Hall 2016), and as technical changes to academic practices enforce immiseration (Marx 1991). Inside a status-driven occupation, predicated upon perceived privilege and a scarcity of access to tenure, the visibility of these experiences is sharpened because technology enables institutions to demand or coerce individuals into overwork, in the workplace and at home. As Marx (2004: 546–547) notes, machinery sets 'the motion of the whole factory', and '[abolishes] the need to bring up a special class of worker for exclusive employment' because it transforms the worker into 'a part of the specialised machine' and a 'helpless dependent' of the cooperative whole.

Capital and Academic Labour

Increasingly, helplessness appears to define the technology-rich relationship between the academic labourer and her institution. In the constant assault by capital on the costs of labour, there is an increasing set of pressures on labourers to remain employable, and this is manifested in the need to demonstrate perpetual entrepreneurialism or to drive down the costs of the services they provide. Thus, academic labour is conditioned by precarious employment that is stripped of its intellectual content (for instance, where that content is outsourced or where staff–student relationships are mediated technologically), or through performance management. Beyond an increased technical composition of academic labour, these processes amplify overwork, self-exploitation, ill health and ill being.

Moreover, the imposition of debt as a way of funding and regulating student learning (McMillan Cottom 2016) acts as a form of pedagogic control at the level of the relationships between institution, academic, professional service staff and students. In particular, as educational outcomes are framed by the value of courses measured by the average salaries of graduates (Belfield et al. 2018), the imperative for individuals is shaped by their contribution to that form of value. Newfield (2010) argues that this generates an increasing proletarianisation of academic practice as it is further stratified in terms of three types of labour. The first of these focuses upon staff who possess *commodity skills*, which are low cost, generalised because they are readily obtained, and whose characteristics are interchangeable. This might include those who offer student support or help desk services, or, in a saturated

market, those employed to deliver generic teaching or to process specific, scholarly datasets. The second type refers to those with *leveraged skills*, which offer limited added value because they are possessed by labour across the sector, such as network administrators, those delivering sector-wide forms of professional development, or even tenured researchers and teachers developing their own projects and courses. The third type pivots around those with *proprietary skills*, which offer significant value through impact, spin-out commodities and commercialisation opportunities.

It is this third type that can resist the attrition on labour rights, as long as the human capital that is generated within and by it maintains its value. In the first two types, there are limited opportunities for rents or profits to be extracted, and, in fact, more opportunity for new, low-cost, technology-rich providers to enter the HE market because they can deliver these skills at lower margins. This is a form of dispossession, and these two types are at increased risk of proletarianisation precisely because they cannot expand a university's competitive edge and are easily replicated (Pusey and Sealey-Huggins 2013). As a result, a persistent demand to innovate becomes essential inside the system, shaped by a discourse of impact and excellence that celebrates the holders of creative knowledge that can be commodified and exchanged.

In this process, there is an increased demand for knowledge to be congealed inside emergent technologies, for instance, through open data and open repositories, learning and performance analytics, artificial intelligence and the semantic web, affective technologies, platforms and so on. As a result, such knowledge reinforced through technological determinism tends to become fetishised, and acts as a governor of academic labour (Jappe 2014). This means that such labour is increasingly defined in its relationship to technology, such that academic work represents a machinic whole, in which the academic labourer is constantly in competition *both* with other such labourers *and* with the technological component of her work. This is because the University is compelled to drive down the cost of variable capital and to increase the technical composition of labour power as one input into the production process. Thus, Marx (1974) argued that this devalued the human world, at the expense of the world of things through the ongoing reproduction of a life mediated through the commodity.

For status-driven academics, this shapes a world of emergent hopelessness, which for Marcuse (1964: 159) is a function of technological instrumentalisation, whereby academic life is reduced to a reactive and reductive, competency-focused state, governed by data driven, performance and risk management. This is a form of cybernetic control, through which the activities of teaching, assessing and research are reduced to the algorithmic definition of inputs and outputs, governed by information flows and modes of feedback (Tiqqun 2001). Thus, the imposition of constant innovation inside academic teams and individuals, grounded in narratives of productivity and the generation of surplus, demands constant technological renewal.

This is witnessed in the disciplinary control of surveillance technologies for performance and workload planning, and for managing student performance and attendance, such that analytics enable hierarchies of control to be reinforced through ready access to data. In the cybernetic hypothesis, stability emerges from inside systems where the exchange of information is fluid. In educational contexts, this is grounded

in, for example, new services enabled through individualised and aggregated data mining; outsourcing access to specific tools and identities to particular platforms or cloud-based tools, which themselves aggregate inputs about individuals from a range of sources; and the transfer of learning materials from the lecturer to platforms or devices (Huws 2014; Pasquale 2018). One outcome of this is the objectification of knowledge, rather than its emergence from inside autonomous human beings, and the creation of new social, relations of production that are in constant flux, and which stand over the academic. This further amplifies the power of university administrators, policymakers and educational corporations, acting as transnational, activist networks, over the academic.

For the academic labourer, it becomes increasingly problematic to envision a way out of the inevitability that her work will be subsumed and re-engineered by the capital relation. It becomes increasingly problematic to imagine how technology can be used to widen autonomy, rather than simply prescribing intensified, proletarianised working practices. This is increasingly the case as the HE sector of the economy that was previously shaped by service provision is commodified (Marx 1991). Thus, technology is increasingly used to subsume the skill, culture, knowledge and capabilities of academic labour, and to automate its contribution to the means for the reproduction of capital. Through the gig economy, precarious and outsourced employment, the use of surveillance data, the transfer of learning content and online assessment, academic labour is deterritorialised by technologies that operate transnationally (Lapavitsas 2013). This transnational, technological operation is amplified through competition, and the ongoing alienation of the academic from her own labour, the products of her labour, her peers and herself (Marx 1974).

The Living Death of Academic Competition

Across transnational HE competition for students, research and teaching resources, and most importantly, time is exerted technologically between individuals, subject teams and institutions. Academics and students lack control over the surplus time that the University demands, and that are managed through metrics and data flows related to workload planning, absence management, performance management, teaching/research excellence and so on. Thus, their resistance tends to focus increasingly on resisting assaults on their own labour power or on internalising entrepreneurial activity as they try to avoid obsolescence.

Here, money has a dominant position. Marx (2004) was clear that credit had a solvent effect, by enabling accelerated competition between individual businesses and capitalists who could gain access to a range of scattered resources. However, this also enables the monopolisation of those resources, for instance, by individuals or institutions that can leverage existing social or intellectual capital. As a result, this increases the sector-wide stratification made visible in league tables, and the financialisation and marketisation of the sector further encloses the lived experience of academics. Competition accelerated by the rule of money generates separation and

opposition, and increases the mediating power of the division of labour, commodity exchange and private property. Thus, Engels (2009: 111) argued that '[c]ompetition is the completest expression of the battle of all against all', and 'a battle for life', waged between classes of society and individual members of these classes.

Defined inside this negative expression of social life, technology has a tendency to amplify the inhumanity of capitalist work as it is imposed inside the University. Thus, in the global North, the apparent need for capital intensity justifies rises in student fees, the access by institutions to bond finance, the implementation of metrics like the United Kingdom's National Student Survey and Longitudinal Education Outcomes, and enforced engagement with institutional audits related to teaching and research excellence. In England, this is framed by a policy framework rooted in productivity and human capital (DfE 2017; Her Majesty's (HM) Treasury 2015). Here, technology underpins competition for student numbers and research funding at both the institutional and subject levels, with an increased pressure on academic productivity and autonomy over the time taken to produce learning materials, research outputs, knowledge transfer and so on.

In maintaining competitive edge, universities act as high technology nodes in competing networks. In part, this emerges through a range of corporate partnerships, including those with software retailers, publishers, management consultants and venture capitalists (McKinsey and Company 2017). Moreover, these partnerships enable the organic composition of capital to increase, as the conditions of academic production are enriched technologically. For instance, the imposition of technologies like lecture capture inside the classroom enables new academic commodities to be produced, which can be used to reshape existing markets, whereas reforming those commodities, for instance, as MOOCs can open up new markets in the global South (Harris et al. 2012), or in the development of the for-profit sector (McMillan Cottom 2016).

Beyond the classroom, infrastructure projects that integrate estates with digital technologies are used to enhance marketing and the recruitment of students, as well as attempting to create the conditions whereby academic labour can be integrated with increasing amounts of means of production, for instance, through open repositories and data projects. However, in this process, there is limited autonomy for the academic labourer, whose existence is made precarious, for instance, as postgraduates who teach, adjuncts, casual teachers and *crucially* students, who lack control over the means of production. Inside such competitive environments, these individuals can *either* sell themselves piecemeal, in their teaching, assessment, feedback, research, scholarship, knowledge exchange and impact, *or* to take on increased levels of debt in the hope of generating innovative human capital (CASA n.d.; CUPE3903 n.d.).

Thus, the costs of competition are born through an assault on variable capital as a persistent response to competition that prioritises investment in fixed capital. This is one further way in which individuals are brought into stark relation with one another, in terms of the value an institution will attribute to them through its desire to invest in their work. There is an interdisciplinary component to this, because in a competitive market governed by discourses of entrepreneurship, employability, excellence and impact, the measurement of student outcomes through data about

earnings, performance and the risks of debt repayment brings different subjects into asymmetrical relationship with each other. Moreover, there is an intersectional asymmetry in operation, precisely because entrepreneurial success inside institutions is typically represented by white, male, able, straight academics, such that other groups, notably women of colour, are less able to leverage investment in their own human capital (Ahmed 2012; Gabriel and Tate 2017).

One outcome of the asymmetry enforced by competition is the ongoing estrangement of the academic from herself and her peers (Hall 2018), and the widening of the sphere of rationalisation, such that self-actualising pedagogic practice is subordinated to the production of objectified and commodified services (Hochschild 1983). Thus, human needs are defined through entrepreneurial activity in competition, and this reinforces alienated social production governed by time (Clarke 1991). Increasingly, the imposition of technologies designed to free up academic time, or to make academic practices generative of surpluses, commodities or value, recalibrate academic teams across institutions and the wider, HE sector. The ability of universities to produce more surplus value relative to those with which they compete is critical. Through new capabilities and increased capacity (generated by efficiency savings), these universities can then revolutionise the relations of production through new labour relations and working conditions.

Thus, we see the imposition of technology-rich, management methods, workload agreements, absence/attendance management policies and so on. These tend to extend the working day, even though units of teaching and assessment are commodified and measured, precisely because they operate in parallel, inside cultures of overwork. This also enables the imposition of accelerated courses of study for degrees, as a process of searching for absolute surplus value. In these contexts, universities are compelled to apply more productive technologies or techniques that restore competitive advantage and relative surplus value, which, in turn, attempts to make superfluous any academic labour that is unproductive. As Meyerhoff et al. (2011) note, this generates contradictions throughout the university because even 'radical faculty… find themselves performing within the university as managers' of their own labour and that of their peers and students, through 'coercive metrics'. Such contradictions underpin the struggle against academic labour.

The Struggle Against Academic Labour

Through competition, capital drives towards the technological abolition of academic labour, whilst depending completely upon that labour for its own reproduction and survival. This is a crucial moment of weakness for capital, and resistance depends upon a movement beyond the fetishisation of such labour to explore the possibilities that exist beyond the binary of employment/unemployment. In addressing this, struggles *for* the abolition of academic labour are crucial. It is possible to consider such a struggle not through accelerationism or techno-determinist logics (Srnicek 2017), but instead through a movement of solidarity with other communities seeking

to reconstitute their own lived experiences on post-capitalist terms. A critical issue is how to uncover and reproduce cooperative or associational practices across the fabric of society, in order to widen collective spheres of autonomy.

The recalibration of HE through platform-based, precarious or entrepreneurial organisational development, which locate innovations in relation to emergent technologies, enable capital to consume our educational lifeworld, by capturing and harnessing lived, educational experiences as commodities for rent, value extraction and profit (Marx 2004). Here, the university becomes a key node in a struggle against valorisation, where academic labourers can reveal capital's historic and material enclosure of human cognition, emotion and physiology, inside its machinery of exploitation. This becomes possible where narratives of alienation, domination, estrangement, exploitation, ill health and ill being become persistent in their revelation. In this moment, alienation is revealed as a key moment in the production of capitalist social relations, and therefore it proceeds praxis, precisely because the proletarianisation that stems from the technical integration of machinery with labour also brings the labourer into contact with technologies that offer the potential means for the production of autonomy.

The increase in the organic composition of capital, through the demand for platform-based cooperation that brings humanity, nature and machinery into a machinic whole, also brings individual narratives and experiences of estrangement and alienation into sharp relief, such that they can be shared across those same platforms, stemming from a range of sectors of the economy. In this way, it becomes possible to delineate and enable a flowering of dissent, rooted in a theoretical, methodological analysis of the historical and material basis for exploitation. It becomes imperative to find spaces and times for the autonomous, counter-hegemonic co-option of emergent hardware, software and networks, in order to generate alternative conceptions of knowledge production potentially as a form of mass intellectuality (Hall and Winn 2017; Roggero 2011).

The struggle here is against the fetishisation of emergent technologies, so as to refuse the reinforcement of hegemonic positions or universal, transhistorical norms. It is important to redefine knowledge production as socially useful and socially enabled, rather than modifying it inside the University for Value. A critical moment lies in the use of technology to enable a movement of dissent that connects academic labour into society, in such a way that its perceived privilege and status can be dissolved into the fabric of communal knowledge production. These moments coalesce as a movement of possibility, which can only be enabled through mutual recognition and processes shaped by dignity. There are already examples of those refusing technological determinism in shaping social relations, occurring at the intersection of the university and society. For instance, the Free Libre and Open Knowledge Society (FLOK 2013) attempted to engage with the idea of the global commons in order to reimagine the integration of knowledge, culture and technology, in part as a celebration of indigenous practices. Elsewhere, informal, temporal projects and collectives like the EduFactory Collective (n.d.) and Rhodes Must Fall (2018) have also attempted to reinterpret the relationship between intellectual practice and society, enabled technologically.

In these struggles, power has been deployed asymmetrically and continues to shape the integration of technology into social relations as a means of recalibrating society for value production. In learning from the failures or limitations of these projects, it is important to imagine struggles as prefigurative of a politics that connects historically and materially to autonomous educational work. Here, there are non-technologically infused examples from the Brazilian Landless Worker's Movement (Canaan 2017) or the Zapatistas (Marcos 2004), which demonstrate the potential for mutual recognition rooted in dignity that stands against an alien, repressive regime.

However, these struggles for the abolition of academic labour must also be mindful that the history of such movements demonstrates the risk of co-option by those with power over their reproduction. This is more so where the technology that enables such reproduction also enables movements for abolition. As a result, engagement with such technologies as enablers of alternative forms of knowledge production or organisation demands self-actualisation as a collective, pedagogical movement. This is a struggle to renew life as we 'develop new principles for the world out of the world's own principles' (Marx 1975: 398). For Clarke (1991: 255), our task is 'to resume the project which Marx initiated of linking an emancipatory social theory to an emancipatory social practice'. A critical issue in the struggle for dignity and against alienated academic labour is whether and how technology can enable this across sectors and fronts. This moves us beyond the seizure of power or the means of production described by the form of value. Rather it demands the re-imagination of technology for autonomy, such that academic labour can be dissolved into communal and cooperative life as common, intellectual practice.

For Autonomy

Marx (1991) describes two interconnected realms inside which human life is possible. The first is the sphere of necessity or heteronomy, where materiality is subject to the production of the means of subsistence. Inside capitalist social relations, this sphere comes to dominate as commodities are marketed as necessities. Moreover, these necessities come to mediate human existence through private property, commodity exchange and the division of labour, brought into relation in the market. The second realm is the sphere of freedom or autonomy. This is a space underpinned by associated, direct production, governed by rational regulation and self-mediation, through which the development of the human as a whole, rather than a partial being is central (Marx1974). A crucial movement in widening the sphere of autonomy and reducing the sphere of heteronomy is the time needed to produce the means of subsistence or the necessities of life.

Thus, it is argued that communism as the association of direct producers is free time, rooted in the deliberate limiting of the working day (Marx and Engels 1998). The subordination of the sphere of heteronomy to the sphere of autonomy demands that direct production is facilitated with the maximum efficiency and the least expenditure of effort and resources. Here, finding ways for individuals to contribute to necessary

social labour for the production of means of subsistence grounded in the general interest, in as short a time and with the minimum of effort, is crucial. This frees up time for autonomous activities, which carry their end in themselves, because they emerge from and flow into personal fulfilment (Gorz 1982).

As work comes under extreme stress through ongoing processes of proletarianisation, including through the increased technological composition of work enhanced through artificial intelligence and automation, widening the realm of autonomy becomes a central, revolutionary concern. For Lukács (1990: 27), this requires intellectual practice at the level of society, involving a reintegration of philosophy with natural science, as a form of '[p]roletarian science'. Here, it is the method of reintegration, seeking to understand and then to recompose the totality of capitalist social relations, which is revolutionary. This is a moment of praxis, through which a theoretical understanding of social reproduction is brought into relation with a practical movement for change, which understands how work is being annihilated by the very system that depends upon that work for its own survival. A critical moment for academic labour is how to take the knowledge, skills and capabilities developed inside the university and incorporated inside machinery, and to dissolve these into the fabric of society, in order to widen the realm of autonomy.

This process does not simply depend upon the liberation of those characteristics of academic practice into society, as a way of refusing the second-order mediations of private property, commodity exchange and the division of labour. Rather, it requires a re-imagination of the social fabric, in order to move beyond value production as an indirect, abstract mechanism for social reproduction. Instead, academic labour dissolved into the fabric of society as intellectual work must be predicated upon a new, communal character of production (Hudis 2017). In achieving this re-imagination of social reproduction, connecting academic practice with intellectual work at the level of society is a priority (Amsler 2015).

Here then, there is a question about the role of technology in this process of re-imagination rooted in autonomy. This must address the fetishisation of technology that is underpinned by technological determinism at the level of society, and which also reaffirms social injustices, where cybernetics impose specific forms of algorithmic control. Addressing how the means of production might be reimagined for an alternative form of social reproduction is a critical question because we are witnessing a collapse in the universe of value that has been accelerated by the long depression following the financial collapse in 2007 (Hudis 2017; Jappe 2016). For Gorz (1982: 8), 'the choice is either a socially controlled, anticipatory abolition of work, or its oppressive, anti-social abolition (the technological abolition of work)'.

There is an important role for academic labour in repurposing technology, in order to imagine that another world beyond the commodified university is possible. This involves enabling movements for the creation of subversive 'living knowledge' (Roggero 2011: 8) beyond the market and exchange value. This is the production of socially useful knowledge as a form of mass intellectuality, which connects open and indigenous forms of skills, knowledge and capabilities, as a new humanism (Hall 2018). The term technologically enabled humanism is a return of time and energy to the individual, such that a new communal existence can be defined through

self-mediation as a new form of wealth, rather than being enclosed and foreclosed (Holloway 2015).

Such a definition connects intellectual work to the use of technology in creating really useful knowledge (Johnson 1980). This as a historical and material connection to radical, working-class organisations like the Plebs' League and the Oxford Central Labour College, and then demonstrates a genealogy that points towards specific, labour movement plans like the Lucas Workers' Plan for Socially Useful Production (Lucas Plan n.d.). The re-imagination of technology for democratic knowledge production, focused upon governance enacted by the direct producers of that knowledge and undertaken in public, is central to a movement against the inhumanity of value. It is in this moment that the technological abolition of academic labour might point towards a transcendence of individual and collective alienation, where the general, productive knowledge, skills and capacities of society become truly social, rather than capitalised. In this moment exists the possibility that the lived reality of communities might be shaped by directly useful knowledge, produced and circulated at the level of society rather than being commodified inside the university. This is the movement for autonomy that lies beyond fetishised, technologised academic labour.

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Chapter 5
Transdisciplinary Engagement with Enforced Dependency: A Platform for Higher Education to Address Crises in Employment, Sustainability, and Democracy in Technological Society

Tina Lynn Evans

Same Valise, Different Handles: The Jobs Crisis, the Sustainability Crisis, and the Crisis of Democracy

My former colleague, sociology professor Jim Fitzgerald, used to say about his classes 'same valise, different handles,' meaning that social issues around which his courses focused were distinct symptoms of similar root problems in culture, social and economic relations, and power structures. Similarly, the current wave of job losses due to machine thinking and doing in the workplace shares common underpinnings with, and calls for similar responses to, the sustainability crisis and threats to the health and longevity of democratic governance.

Sociologist Collins (2013: 38) describes technological displacement of labor as 'the mechanism by which innovations in equipment and organization save labor, thereby enabling fewer employed persons to produce more at lower cost'. The employment crisis is perceptible in the economy where job losses have been well documented and are now permeating areas of work once thought to be robot-proof (Aoun 2017; Davidson 2017: Chap. 5; Madsbjerg 2017). This process is, however, more a symptom than a cause of what ails us in late capitalism (Collins 2013; Wallerstein 2013). Rather than deriving solely from new technologies, the jobs crisis ultimately stems from social, cultural, political, and ontological foundations of industrial capitalist societies (Collins 2013; Wallerstein 2013), the same foundations undergirding the crises of sustainability and democracy that are converging in unison with the jobs crisis.

That technology has come to represent ends themselves in industrial societies, rather than the means to address a deeper vision for the common good, indicates that many of us have lost our way as meaning-making, social beings. Much of our work

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has become doable by machines because we have made ourselves machine-like. We have stopped doing much of the empathy- and reciprocity-based relationship building and nurturing work that has made us fundamentally human. In modern education and work, much of our creativity and sensemaking has also been sidelined. It is this very human work upon which we must refocus so that we might build resilience and conviviality (Illich 1973) with each other and nature (Evans 2012).

Risks are running high, and it remains unclear to what extent people will be able to live sustainable and fulfilling lives in diverse places globally, but it is imperative that we do our best to prepare ourselves to respond appropriately to and participate meaningfully in addressing the challenges we face. We can begin to do so by incorporating overarching themes and practices into what and how we teach and learn, in formal settings such as educational institutions and informal settings such as communities, workplaces, agencies, and organizations. Taking stock of our current situation—looking inside the valise—provides a starting point for identifying these themes and practices, but we need to do more than comprehend the sources and drivers of our problems. Through transdisciplinary, critical, and creative thinking and action—in education and communities—we must replace the sociocultural baggage we carry, ultimately transforming social systems by questioning their organizing assumptions and creating sustainability-oriented, liberating alternatives (Evans 2012).

Proposing roles for education in supporting employment amidst automation while also fostering the health and integrity of human/natural communities requires that we consider what we are up against. We begin by exploring enforced dependency as an overarching theme of many currently converging socio-ecological crises. We will then briefly explore three key and interrelated examples of these crises: the jobs crisis being driven by technological displacement of labor, the socio-ecological sustainability crisis, and the crisis of democratic governance. Following this discussion, we will explore how higher education can best serve people and nature over both the short and long terms by helping individuals maintain livelihoods while also addressing these significant challenges.

Now, let us look inside the valise.

Enforced Dependency: A Thematic Thread in Converging Crises of Our Time

Enforced dependency serves as our central heuristic for identifying enduring themes for education that make it both robot-proof and apt for addressing pressing issues of our time. I developed the concept of enforced dependency in *Occupy Education* (2012) where it served as a lens for identifying and analyzing self-perpetuating themes of oppression in society—and for generating alternative themes relevant to realizing social equity and sustainability.

> Enforced dependency is a form of reliance upon external resources or externally created conditions. For such dependency to function as enforced dependency, it must, once established, progressively undermine the self-sufficiency and resilience of the dependent person, community, institution, or government, making the dependent party increasingly vulnerable to exploitation. The initial conditions of enforced dependency are often established through colonialism or imperialism. The 'enforcement' of enforced dependency derives from the increasingly dangerous and/or destabilizing results that would entail from severing the dependent relationship. Under conditions of enforced dependency, the resiliency of the dependent party decreases progressively over time. Typically, dependent parties are also progressively co-opted into supporting the system of enforced dependency upon which they have come to rely, even as the system progressively robs them of freedom, independence, and resiliency. (Evans 2012: 86)

Examples of enforced dependency abound in industrial societies and across the globalized world. They occur at varying scales, from the personal and familial to the global. Recognizing enforced dependency as an organizing theme that undergirds the challenges we face, in the workplace and beyond, provides a platform for addressing these challenges. Enforced dependency can serve as a useful lens for identifying and selecting competencies to teach that will help students maintain and expand their employment viability, choices, and potential for advancement in the high-tech industrial economy. Addressing enforced dependency in the long term is also crucial for socio-ecological sustainability—and for envisioning and carrying out the cultural change required to achieve it. We must help students to recognize enforced dependency and to seek careers that help them avoid its grip. We must also help prepare them to effectively engage in communities to foster autonomy, the well-being of people and nature, community vibrancy, meaning, and beauty.

We now examine three instances of enforced dependency in late capitalism: the jobs crisis, sustainability crisis, and governance crisis. We will then consider how enforced dependency and its many antidotes can and should form transdisciplinary themes for higher education that is appropriately responsive to these crises.

The Jobs Crisis: Technological Displacement of Labor and the Coming Economic Crisis

The technophilia and the linearly progress-oriented culture of industrial societies are not new but a continuing manifestation of the machine paradigm of modernity (Spretnak 1999). We have made ourselves cogs in machines, and even in many white-collar professions such as securities trading, accounting, and finance, we can now be replaced, in part or entirely, by newer, and in some ways better cogs in the form of artificial-intelligence-equipped computers (Aoun 2017). The jobs crisis is deeply infused with enforced dependency. We have little to no choice about using new technologies that become inextricably integrated into the fabric of work and daily life, yet these technologies progressively undermine the ability of many to secure and maintain livelihoods.

Automation eliminates jobs (Collins 2013; Hall and Klitgaard 2018: 491). In the twentieth century, we witnessed widespread automation of blue-collar jobs in manufacturing. Many former manufacturing workers sought employment in the service industry, but that sector, too, has become increasingly automated. Though new jobs are created as a result of technological innovation, their numbers are typically fewer than those of the jobs lost. The trade-off for technological displacement is lower consumer prices, but lower prices are little help to unemployed workers. We are moving toward a crisis of capitalism in which the disappearance of middle-class work leaves increasingly fewer people to purchase the vast products of industry (Collins 2013; Douthwaite 2004; Evans 2012: Chap. 4; Greider 1997; Hall and Klitgaard 2018: Chap. 7; Wallerstein 2013). As this crisis unfolds, we must determine both how best to prepare people for employment while also preparing them to mitigate enforced dependencies and foster the well-being of people and nature.

Advances in computer hardware and software have made possible computer-based artificial intelligence (AI) that is increasingly competent at convergent thinking, a process of identifying the best solution among several, or even multitudes, of potential solutions (Aoun 2017: 49). Computers programmed to sift through massive digital data sets to identify correlations and patterns can far outperform humans at these tasks. IBM's AI machine Watson demonstrated high-level convergent thinking when it beat two all-time Jeopardy television quiz show champions (Aoun 2017: 77–79). AI software also allows computers to sift for possible solutions in massive data sets by identifying and prioritizing certain conditions.

Computer programs, however, are not equally adept at divergent thinking: the creative synthesis of new ideas and solutions (Aoun 2017: 49–50). Even the most sophisticated computer programing has yet to approach human abilities to read cultural contexts and respond appropriately to situations or challenges within those contexts. Experienced and thoughtful humans can effectively interpret and respond to issues of appropriateness, justice, compassion, morality, and aesthetics. We can discern in which contexts particular actions are appropriate and even laudable, and in which situations these same actions are ill advised and damaging. Humans can also apply ideas and strategies developed in one context to entirely new or different scenarios or problems (Madsbjerg 2017). This work is much less about sifting, sorting, correlating, summarizing, and matching, and much more about interpreting context and meaning. Madsbjerg (2017) calls this work 'sensemaking.'

Sensemaking takes place within specific historical contexts and within ethnic, geographic, religious, familial, and institutional cultures. Experienced and efficacious leaders know that the fitness of a decision is culturally and situationally dependent. We learn that context matters largely through developing a sense of empathy: the ability to see situations from multiple perspectives, each infused with culture and individual/collective subjectivity and emotion. This is human work that will remain essential in societies for the foreseeable future (Madsbjerg 2017) as we address the complex problems we face. People will use computers and AI to assist with thinking tasks, but we ought not to turn decision-making over to machines unable to make full and contextual sense of the data they manipulate.

Fostering students' abilities to conceptualize, interpret, synthesize, create, communicate, relate, empathize, and lead will help prepare them for work that is not only robot-proof (Aoun 2017; Davidson 2017; Madsbjerg 2017), but essential for the long-term socio-ecological health of humans and nature. Graduates who have developed these competencies will be better positioned for avoiding enforced dependency in the workplace—for being able to seek and secure meaningful work. In the closing sections of this chapter, we will explore how to foster these abilities intentionally and successfully in higher education. In the following section, we briefly explore the global sustainability crisis as a manifestation of enforced dependency and a crisis that calls out for deep and widespread sensemaking.

The Sustainability Crisis in Environment and Society

In my teaching, I use a definition of sustainability developed by ecological economist Pittman (2007) who describes it as 'the long-term equilibrium of health and integrity maintained dynamically within any individual system (organism, ecosystem, community, etc.) through a diversity of relationships with other systems.' I find this notion of sustainability useful because it is comprehensive, integrative, and flexible while still maintaining a normative core, and because it calls upon people to foster health and integrity in specific contexts and at multiple scales.

We have much to answer to in heeding the call for sustainability:

- Anthropogenic climate change that is wreaking havoc with ecosystems worldwide, displacing people in island and coastal communities, driving extinctions in oceans, rivers, and on land, and causing massive migrations of people, animals, and plants;
- Widespread pollution in water bodies, on land, and in the bodies of living creatures, including ourselves;
- Continual habitat takeover by humans, leaving many other species nowhere to go;
- Overexploitation of agricultural lands, leaving the soil depleted of nutrients and organic matter and subjecting it to erosion;
- Overfishing that damages ocean ecosystems and depletes an important food source for people;
- Mining of nonrenewable resources that are consumed, scattered, and thereby depleted; and
- Deepening social inequity and oppression, leaving many without access to the basics of life, and sharply limiting opportunities for personal growth and fulfillment.

The list could go on and on. In short, we are killing and destroying our home, the source of our own survival, and undermining healthy social relationships necessary for nurturing human potential.

The crisis of sustainability represents enforced dependency in industrial society. We participate in these ravages, not because we desire to destroy nature and each

other, but because most of us rely on an economic system that assumes these ravages necessary for the economic growth that provides our sustenance and staves off currency collapse (Czech 2013; Daly 1999; Douthwaite 1999a, b, 2004; Heinberg 2011).

The creative, synthesizing, and leading work that we need to address the sustainability crisis in culture, politics, and economics is not the work of machines. It takes different shapes in different contexts and requires divergent thinking. It is human work, and it is our most pressing challenge. Because of the common competencies required, preparing students for sustainability work inherently prepares them for robot-proof work.

The crisis of democracy is the last of the three examples of enforced dependency we will explore. We will focus on how human work remains essential to making government by the people and for the people possible and effective at addressing the challenges of modern life.

The Democracy Crisis

We expect poor social and environmental outcomes from tyrannical governments, but many democracies demonstrate similarly poor outcomes. They may fail to encourage active citizenship for community-level resiliency and vibrancy in economic, cultural, and social life. They also too often fail to ensure the health and integrity of natural systems upon which their citizens rely.

Yet dependency on suboptimal governance continues to be enforced, in part, through widespread recognition of the demands on our time and energy that active and purposeful participation in collective life would entail. In a society where people increasingly struggle to earn a living, working two or three low-paid jobs to do so, these demands may pose insurmountable challenges. In large measure, our lack of time for participatory governance is driven by the jobs crisis discussed above. The two dependencies, the jobs crisis and the governance crisis, intertwine and reinforce each other.

Dependency on poor governance is also enforced through the widely held notion that leaders possess inborn talents and abilities that ordinary people do not. According to activist and author Loeb (2010), media portrayal of leaders as lone-wolf heroes reinforces the idea that they are born, not developed. Many times, we have limited access to stories about how leaders have learned and developed their practice over time, making many mistakes along the way. Perhaps most importantly, we rarely hear about the encouragement and mentoring required to support an effective leader in her/his development and practice. Because we find it difficult to measure up to the leader-as-hero, we may assume we are incapable of leadership, resulting in our withdrawal from public life.

The crisis in governance also derives, in part, from political structure. Political scientist and politician Kemmis (1990) describes U.S. government as a system in which citizens rely upon professional politicians, working in an adversary-based

model, to render decisions on matters important to people and communities. This winner-take-all, two-party system of representative governance encourages people to pursue private ends rather than coalesce around a vision for the common good. Like its contemporary, Adam Smith's invisible hand of the marketplace, U.S. government is structured as a self-regulating machine designed to balance diverse, private notions of desired outcomes, and thereby achieve useful social outcomes. Governing in this representative system theoretically requires no collective vision for, articulation of, or willing of a common good. Opponents rarely collaborate in seeking solutions or directly discuss values or goals. Instead, they appeal to decision-makers in polarized and strident terms, thereby deepening political divisions (Briand 1999; Kemmis 1990).

Alternatively, when citizens collaborate directly in problem-solving, they may learn that they share many common values and interests with diverse community members. They may develop 'public values,' widely shared perspectives about community life and environment. These shared values form a basis for trust and collaboration that can enhance the resiliency and vibrancy of the community (Kemmis 1990). Through participation and collaboration, citizens also develop leadership skills and experience the rewards of relationship building and knowing they can make a meaningful difference in their communities (Bond 2004; Briand 1999; Evans 2018; Kemmis 1990; Loeb 2010).

Addressing enforced dependency in governance and building healthy communities require participation of citizens who can effectively listen, empathize, envision, communicate, collaborate, and lead at the community level. Meaningful and widespread participation in collective life fosters the development of leadership skills and the recognition of self-efficacy required to sustain participation for the long haul. This work is human, not machine, work that must be finely attuned to social and cultural contexts, and it is crucial to sustainability in the U.S. and other places. This work also embodies resistance to enforced dependency upon elected political officials as adjudicators of the common good.

* * *

If we want secure and meaningful livelihoods, sustainability, and community vitality, it is time for new implements and strategies for social and community life—time to exchange the contents of our valise. Higher education can help us identify what to keep and what to discard as well as when, how, and where to do so. That project is the subject for the remainder of this chapter.

Being Human: Education for Long-Term Employability, Sustainability, and Democracy

Higher education's focus on supporting employability in the economy as currently structured, though important, falls short of enabling us to address the long-term crisis of capitalist concentration of wealth and power that leaves more and more people

struggling to make ends meet. It also falls short of addressing the crises of democracy and sustainability that call into question our purposes and responsibilities as human beings and culture makers (Berry 1990; Madsbjerg 2017: Chap. 8).

To address the challenges we face, we need a multipronged approach toward education, an approach that helps people maintain livelihoods for the short term while also preparing them for social agency toward repurposing, reorganizing, and reinvigorating societies for resilience, sustainability, democracy, and meaningfulness. These transformations should arise from a drive to liberate people from enforced dependency on an economy in which powerful players bestow jobs upon waiting masses. In such an economy, we remain vulnerable to the whims and desires of a powerful minority. There are many reasons why the economy has become structured as it is (Czech 2013; Douthwaite 1999b; Heinberg 2011), but there are no good reasons why we should perpetuate this broadly damaging and disenfranchising system as the singular approach for organizing human work. There are other pathways forward (Boik 2014; Czech 2013; Douthwaite 2004; Evans 2012, 2018; Heinberg 2011: Chap. 6).

Understanding enforced dependency as a central theme permeating many aspects of globalized, industrial society helps illuminate these pathways. Students should engage in critical exploration of enforced dependency operating in various realms and at varying scales in societies, exploring how it works and how it is maintained. Then, rather than asking how technology and corporations can save us, or how industry can be pressured by government into doing so, students should be encouraged to ask how we can save ourselves by developing and participating in solutions that satisfy our needs and ensure sustainability while also promoting autonomy, inclusiveness, and freedom (Evans 2012).

In order to emphasize critical study of enforced dependency, educational programs and institutions must maintain sufficient autonomy to ensure their ability to help move society in new directions. Social change leadership is not typical for institutions of higher education (Crow 2015; Evans 2015b), especially in these times of declining government support and a consequent turn to industry as a source for educational funding.

The influence of industry in education and the drive for educational institutions to prepare students for employability encourage the practice of courses and programs partnering with businesses through projects and internships (Aoun 2017). This practice is both useful and, at times, wrongheaded. When partnering with powerful organizations such as transnational corporations, educators must remember that these entities have ends that may conflict with fostering the autonomy of people and communities. Industry interests may, in fact, be well served by enforcing dependency of people on products and services they sell. Higher education must remain sufficiently autonomous, and adhere to the principle of academic freedom, in order to develop and maintain a strong focus on education that looks beyond preparing workers for industry as its sole purpose.

This is not to say that higher education partnerships with industry are bad in themselves. They can open important opportunities for graduates to secure livelihoods, pursue career advancement, and support other socially and/or environmentally ben-

eficial ends. Concomitantly, many businesses are moving beyond a singular focus on the bottom line. Members of the Business Alliance for Local Living Economies (BALLE 2018), owner-operators of cooperative businesses (Abrams 2008; *Cleveland Model* 2012), and benefit corporations, a.k.a. B-corps, earn profits while offering workers fair compensation, benefitting communities, and/or caring for nature. Some transnational corporations also take the sustainability crisis seriously, and more thoughtful business practices are having important and wide-reaching effects.

Still, because we must prepare students to live well in current times while offering them significant opportunities to develop abilities relevant beyond the horizon of late capitalism, we must teach competencies and skills that supersede satisfying the immediate and rapidly changing needs of employers. We must prepare people to become divergent, creative thinkers who can fare well in a changing workplace over time while also addressing the broader needs of sustainability and good governance.

Some prominent educators and theorists currently envisioning and enacting educational approaches relevant for both the short- and long-term needs of people emphasize the importance of creativity, synthesis, empathy, sensitivity to context, and discernment (Aoun 2017; Davidson 2017; Madsbjerg 2017). Study in the humanities and social sciences provides experiences and knowledge well suited to developing these competencies. Madsbjerg (2017) argues that studying humanities develops our abilities to function well within different cultures—that in-depth engagement with history, literature, theater, foreign languages, philosophy, and art calls upon us to engage imaginatively and creatively with characters, stories, perspectives, and ways of thinking different from our own. These virtual experiences allow us to see things through the eyes of those from other backgrounds, times, and places and to interpret their expressions within particular personal, historical, cultural, and situational contexts. These experiences represent important avenues for developing forms of thinking, analysis, and creativity not easily matched by computers (Madsbjerg 2017). Engaging with social sciences in areas such as sociology, anthropology, psychology, economics, and political science opens additional important pathways for learning theories that can support divergent thinking when interpreting social, political, economic, and cultural phenomena. The social sciences and humanities offer critically important foundations for decision-making, understanding, and caring that are distinctively suited to addressing complex socio-ecological issues.

Certainly, we also need science, technology, engineering, and math (STEM) education, but not exclusively (Aoun 2017; Davidson 2017; Madsbjerg 2017). STEM fields help us comprehend phenomena and delineate the possibilities and limits of what can be done in a given situation, but they are insufficient in themselves as bases for knowing what *should* be done. As I have argued regarding leadership study and practice (Evans 2018), it is not enough to have better tools in one's toolbox—one must also select appropriate work to do. Work in STEM fields will be essential to addressing the converging crises we face, but to ensure this work serves desirable socio-ecological ends requires contextualization for decision-making that draws on other disciplinary frameworks.

Transdisciplinary studies are perhaps most directly suited to the twin purposes of preparing graduates for both long-term relevance in the workplace and effective

engagement in social change. They build upon, integrate, and enhance study based on traditional disciplines through focusing student attention on complex issues in direct and concrete ways and engaging them in relevant project work. Transdisciplinary work is beyond integrative. It not only calls upon the domain knowledge of various disciplines but also takes into account the epistemological framing of disciplines themselves, framing that points to the strengths and weaknesses each field can bring to addressing a given issue. Transdisciplinary work is situated within socio-ecological contexts and aimed at addressing challenges and needs at varying scales within these contexts (Evans 2010, 2015b).

High-level transdisciplinary competencies are human competencies of divergent and creative thinking infused with discernment. Transdisciplinary studies prepare students to create social changes we need while also ensuring their future relevance in a largely automated workplace. The remaining sections of this chapter focus on transdisciplinary theory and practice that serve these twin purposes.

Repacking the Valise: Teaching for Robot-Proofing and Sustainability

As a sustainability educator, I am concerned with, not only preparing students with information and skills useful for careers, but also with helping them construct a deep conceptual framework and related practical experience that can serve as a platform for lifelong, sustainability-oriented learning and doing in workplace, personal, and civic life. A central premise for my teaching is my conviction that students are in search of meaning: they want to matter as people, and they want their work to matter, too. They want to affirm their own value and connect with family members, workplaces, and communities where they experience belonging and can participate meaningfully in decisions that affect their lives, the lives of others, and the environment. Their drive for meaning opens the door for transformational learning (Brookfield 1987; Mezirow et al. 2000) that can promote social change.

In my sustainability classes, I have come to follow a trajectory that works well in teaching a variety of subjects. Early weeks of a course focus heavily on reading and discussion. Students critically engage with complex issues and problems in socio-ecology, exploring the drivers behind and relationships among these phenomena. I ask students to explain these phenomena in group discussions, full-class discussions, and writing. Going beyond explanation, I ask students to relate these issues and their understanding of them to their personal knowledge and experience. Importantly, I do not ask them to agree with authors, film content, other students, or me. They are free to disagree, and this option is made clear in the way I word discussion and assignment questions. I grade students on their understanding of course material and the depth with which they relate this material to their lives, not on whether or not they agree with ideas presented in class. Still, students must present solid rationales for judgments they make about the value and meaning of what they learn.

During closing weeks of the course, students participate in classroom-based or out-of-class action related to course content, or they conduct research relevant to taking action on subjects studied. In lower division courses, I typically ask students to research and present material on individuals, groups, communities, or organizations taking action to address sustainability challenges. In upper division courses, students engage in hands-on projects or in-class simulations related to course material. In research-oriented upper division courses, students undertake independent inquiry related to subjects studied, and I encourage them to choose lines of inquiry that have intrinsic meaning for them. I stress how research can be an exciting meaning-making and creative process of discovery, analysis, and synthesis, all embedded within a larger social context (Bentz and Shapiro 1998). My overarching pedagogical approach is a transdisciplinary one in which students learn in depth about complex issues and problems and then practice intellectual and/or hands-on engagement related to addressing these problems.

As one way to gage the effectiveness of my pedagogical approach, I conducted grounded-theory-based research on how aspects of sustainability education generate and maintain—or detract from generating and maintaining—hope and agency among students (Evans 2015a). I found that their learning experience fostered hope and agency through two broad avenues: conceptual engagement and social engagement. Conceptual engagement involves critically evaluating, analyzing, synthesizing, and contextualizing knowledge into big picture understandings that can shape one's worldview and judgment and influence one's beliefs and actions. Social engagement involves 'learning and action connected to human relationships in classroom, community, and organizational settings.' It can also be 'fostered through participation in events' (Evans 2015a: 15). Both conceptual and social engagements were important, seemingly almost equally so. I recognized that my approach to engaging students with deeply critical concepts early in my courses (conceptual engagement) combined with involving them in socially contextualizing and applying those ideas in later stages of courses (social engagement) was indeed a powerful combination for generating hope and agency, both of which are necessary for engaging in social transformation.

In addition to educating for sustainability, conceptual and social engagement also represent education for robot-proofing. Through studying enforced dependencies then formulating appropriate, sustainability-oriented responses that reduce these dependencies, students develop divergent thinking, interpreting, contextualizing, and discerning abilities that are not easily demonstrated by computer software and robots.

I have found this general approach works well when teaching about many socio-ecological issues. The following selected list of such issues includes references to sources that can serve as starting points for teaching these subjects to undergraduates:

- Ontology (Armstrong 1995; Berry 1987, 1990; Cajete 2000; Gomes and Kanner 1995; International Society for Ecology and Culture 1993; Martinez 2010; Norberg-Hodge 1991/1992; Salmon 2000; Spretnak 1999);

- Community-based sustainability and localization (Abrams 2008; Berry 1987; Brock 2017; Bond 2004; Chiras and Wann 2003; Douthwaite 2004; Evans 2012, 2018; Holmgren 2002/2011; Hopkins 2011; Kemmis 1990; Shuman 2012, 2015);
- Food system sustainability (Bane 2012; Kenner et al. 2009; Lyson 2004; Norberg-Hodge et al. 2002; Pfieffer 2006; Pretty 2002; Shiva 2000, 2008);
- Energy issues in society (Pahl 2012; Morgan et al. 2006; Scheer 2012);
- Governance and social activism (Brock 2017; Briand 1999; Evans 2018; Grossman 2005; Hopkins 2011; Loeb 2010; Moyer 2001; Shiva 2005);
- Sustainable economics (Heinberg 2011; Ludwig et al. 2006; Shuman 2012, 2015; Wicks 2009); and
- Converging crises of sustainability and responses to them (Evans 2012; Homer-Dixon 2006; McDonough and Braungart 2013; Robbins 2013; Robertson 2017; Tainter 1988).

In order to clarify how the transdisciplinary theoretical grounding and pedagogical framework developed in this chapter can be applied, we now explore their use in a specific course.

Conceptual and Social Engagement in Sustainable Economics

Sustainable economics is a junior-level course in the Sustainability Studies Bachelor of Arts program at Colorado Mountain College. I discuss this course as an example of applied theory and pedagogy because the readings with which the students engage are almost entirely comprised of two texts that represent a fairly clear division between conceptual and social engagement, both addressed within a transdisciplinary framework of studying and responding to enforced dependencies within the globalized industrial economy. The course also provides a clear example of how content and processes of sustainability education aimed at mitigating enforced dependencies can foster important competencies that diverge from those of computers running AI programs—forms of mastery that prepare graduates for careers in which they may integrate the products of machine work to support their own sensemaking, discernment, creativity, and synthesis.

The course begins with a brief discussion of the concept of enforced dependency followed by viewing the film *Life and Debt* (Black 2001) about the external debt crisis in Jamaica. The film highlights how the crisis in Jamaica, as in many developing nations, is the result of historical factors, beginning with European colonization, that lie well beyond the economic and political control of the indebted country. The debt is a clear example of enforced dependency. Repaying it at the expense of supporting the nation's people and its development continually undermines Jamaica's abilities to promote its own economic, political, and social health and integrity. At the same time, defaulting on the debt would be unacceptably risky: the entire economy might simply collapse as a result. The film and the discussion about it set a tone for the

course as one that will explore why and how globalized industrial economy creates widely divergent outcomes and widespread enforced dependency in communities and nations worldwide.

The remainder of the conceptual engagement with enforced dependency in the course centers around students reading, discussing, and writing about *Energy and the Wealth of Nations* (Hall and Klitgaard 2018). Students explore where money comes from and why the way it is created mandates economic growth to stave off collapse of the monetary system, why unending economic growth is impossible in a finite biosphere and amidst the structural crisis of capitalism, how economic thought has developed over time and whose interests divergent lines of thought have served, neoclassical economics as an ideology largely based in untested assumptions about people as primarily acquisitive and the economy as self-regulating, why and how analytical models in economics mostly miss the mark in accurately depicting economic reality, why the capitalist economy is vulnerable to downturn and collapse, how and why the housing and financial bubble developed and then burst in 2007/2008, why and how wealth has become so concentrated nationally and globally, neoliberalism as an ideology, and more.

In short, students explore many themes relevant to understanding globalized industrial economy as a system permeated by enforced dependency. They also come to see that the economy as we know it does not necessarily represent a culmination of progress, rendering the best of all possible economic and social worlds. They learn that many mainstream economic ideas and practices were developed quite recently and that other economic ideas and systems are plausible. They also learn that the economy is not a stand-alone system, but is embedded within larger social and ecological systems, and is subject to the limits of those systems.

This conceptual engagement sets the stage for social engagement in synthesizing a proposal for a local complementary currency for Steamboat Springs, Colorado. The proposal is a simulation project based on the book *Economic Direct Democracy* (Boik 2014). Students envision how a complementary currency could foster community vitality and promote inclusion of all community members in economic life and in supporting desired businesses, services, and socio-ecological outcomes. This is complex and context-specific work. Throughout this month-long project, students employ their discernment and sensemaking abilities to apply/adapt ideas from Boik's (2014) text, and to develop and apply entirely new ideas. They must flesh out their work in some detail, offering rationales for why their model would be attractive, practical, and beneficial for the community. In so doing, they develop skills relevant to actively addressing the sustainability and governance crises, skills that also represent robot-proof competencies. Their final product is a presentation about the value and potential, as well as the mechanics, of implementing a local complementary currency. This project represents practical and creative social engagement with mitigating enforced dependency and promoting community autonomy, vitality, and ecological health.

As a whole, the course models transdisciplinary processes of lifelong learning and socio-ecological agency in which a person/group first develops an understanding of a context and its potentialities and then creatively responds to that knowledge by

formulating ideas and proposing practices to benefit people and the larger socio-ecological context. This synthesizing, creative, communicative, divergent-thinking-oriented, and judgment-laden work is precisely the kind of work that is most robot-proof (Aoun 2017; Davidson 2017; Madsbjerg 2017). It is also the work of hope, agency, participatory governance, and sustainability.

Conclusions on Robot-Proofing Education—And Saving the World

We have explored institutional and pedagogical approaches in higher education for addressing the twin purposes of robot-proofing graduates while also preparing them to meet the challenges of sustainability and good governance. In so doing, we have identified a number of essential items, thematic foci, to include in our educational traveling bag as we face the challenging journey ahead. Central among these foci is helping students learn to recognize and mitigate enforced dependencies in society. This work requires development and application of transdisciplinary (Evans 2015b), interpretive, context-sensitive, creative, and sensemaking skills that are, as yet, uniquely human. We will surely need additional ideas and competencies along our journey as we prepare students for living well in a rapidly changing world. We must remain open, continuing to learn about and adapt to specific contexts that are themselves in flux.

Perhaps most important of all, we need to develop, model, and teach empathy and humility as foundational stances and approaches to understanding new situations. We cannot focus solely on teaching existing domain knowledge because that knowledge may be, in whole or part, a manifestation of the very converging crises we face. Drawing on domain knowledge is also something computers can be programmed to do very well, and our students will need skills that go beyond what computers can do. Therefore, we must situate the content we teach within the broader context of fostering sustainability and democratic governance while promoting secure, rewarding, and meaningful work. Focusing course content through the lens of enforced dependency can help us identify needed changes to what and how we teach.

Through educating with and for empathy and humility, we also acknowledge that we cannot effectively generate meaning in our lives without exploring meaning as it arises in diverse others through their situated perspectives. We experience meaning more fully when we recognize and honor it in others, acknowledging that we do not have all the answers and that we have things to learn that represent opportunities for collaboration and relationship building. As social beings living within and through nature, to thrive, we must care about and care for others, both human and other-than-human. As educators, we must do our best to foster students' empathic abilities to connect with people and nature in thoughtful and mutually beneficial ways. In so doing, we honor their search for meaning and hone their skills to do the caring, creative, and context-responsive work that machines cannot.

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Chapter 6
Is Entrepreneurial Education the Solution to the Automation Revolution?

Chris Arthur

Introduction

The automation revolution is here, and its networked, metallic and cloud-based cadres do not demand bread, nor do they desire liberty, equality or fraternity. They have come for your job. Already the chief cause of job losses and wage reductions in the last 20 years (Dao et al. 2017b), researchers from Oxford argue this silicon mob could render over 40% of jobs in the United States (US), 57% across the OECD, 69% in India and 77% in China obsolete within the next twenty years (Frey and Osborne 2013; Frey et al. 2016). Fueled by advances in data analytics, artificial intelligence (AI) and the Internet of Things (IoT), they predict the mob's reach will only continue to grow, threatening to take not only jobs in manufacturing, transportation and retail but those involving diagnostic, research and analytical skills. The robots are at the gates of factories and doors to the mall but are also amassing outside doctors' offices, teachers' classrooms and journalists' homes.

Politicians, business organizations, journalists and educators, particularly in the US, the UK and Canada, view this revolution as an existential threat requiring the reconfiguration of systems of education to create entrepreneurial individuals. Nearly every single policy document or report on a new education initiative to meet this 'threat' begins with the same narrative: our world is becoming more competitive, technology is remaking our world, and to ensure our citizens can keep up, reverse ecological devastation and make the lives of the marginalized better they need to be taught *x* using *y* technique. Promoted as 'life-long learning', preparation for the 'knowledge economy', 'Grit', Science, Technology, Engineering and Mathematics (STEM), 'twenty-first century competencies', 'humanics',[1] 'financial literacy',

[1] In this context, 'humanics' refers to the study of skills and dispositions that will enable human workers to complement automation technologies or do jobs robots cannot do (Schawbel 2017).

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'entrepreneurship education' and 'enterprise education', the broad aim of this dizzying array of entrepreneurial education initiatives is to create resilient, optimistic, confident, creative, digitally fluent, agile, imaginative, risk-taking and problem-solving lifelong learners. These uber-humans will harness automation innovations to create meaningful work which robots cannot yet do, ensuring they and their nation are economically secure.

Two seemingly opposed ideological discourses inform this project, one appearing more 'progressive' and the other more 'conservative'. The first is popular amongst educators and castigates education institutions for failing to use the progressive and humanist pedagogical techniques assumed necessary to prepare students for the autonomous, meaningful and cognitively challenging work that awaits in the future. Leadbeater, a former advisor to Tony Blair and now a 'leader' in 'thinking on innovation and creativity' (2016: 1), is typical of supporters of the 'progressive' entrepreneurial discourse, stressing that institutions must change to meet the needs of those most marginalized by replacing rote, repetitive learning, which he glosses as 'routine, mechanistic, [and] disconnected from life' (2016: 20), with 'collaborative', 'interdisciplinary' 'problem-based' learning in which students and teachers do 'great work together' (2016: 21). The second discourse sounds a more conservative tone, promoting the 'traditional' teaching methods Leadbeater finds problematic while stressing 'personal responsibility' (often part of initiatives promoting 'character education', 'Grit', a 'growth mentality' or 'learning from failure'). NEXT Canada, a non-profit which promotes entrepreneurship in Canada, provides a concise illustration of this discourse, arguing that youth must be instilled with the 'ultra competitive nature' necessary for 'excellence', reversing the fear of failure, dependence and acceptance of mediocrity borne from schools' commitment to 'egalitarianism' and teachers' 'coddling' and 'babying' of students (Lacavera 2017: para. 7). There are no excuses for failing to continually strive, an ethos Greg Bass, Alberta's Deputy Minister of Education, voices to students facing a tough job market: 'If you can't get a job, then create one' (Parmar 2014: 28). As with protectionism or managed-trade, 'coddling' stunts the competitive capabilities of those coddled, resulting in inequitable outcomes.

These seemingly opposed discourses represent two manifestations of neoliberalism's ethic of 'equal inequality' (Lemke 2001), presenting the continual intensification and expansion of competition as both our ontological reality and a moral project to be implemented. The 'progressive' discourse stresses the need to equally distribute the necessary means and opportunities to ensure everyone can effectively compete while its conservative counterpart emphasizes that everyone must be exposed to competition and held to account for failure. In stark contrast to the post-WWII Keynesian Welfare State (KWS) ethos, which aimed at improving/equalizing outcomes through limiting market forces and collectively providing vital social goods and services, 'equal inequality' is a distillation of an idealized and moralized 'creative destruction' which holds as just the fleeting character of both failure and success: the successful must continually improve and create new ways to produce value (or lose their place), while those who fail must remain optimistic and confident, learn from their failure and rejoin the competition. Conservative and progressive versions differ in how to

bring about this vision and in determining a just minimum competitive level (e.g. How should we assist those who fail so that they can better compete again? Should we focus on teaching the 'basics' or assisting students 'discover' and 'construct' knowledge? Should everyone have the same quality of education? Should we restrict or even allow inheritance of wealth?), but, sharing a common aim, the underlying ontological and moral message of both is the same: in the 'new economy', as the Royal Bank of Canada reminds us, 'it doesn't matter what you've done—it matters what you can do' (RBC Wealth Management n.d.: para. 18).

Many educators believe entrepreneurial education's promises, but their faith is misplaced. Analysing its manifestation in education policy and popular discourse in Canada, the US and the UK, I argue in the first section of this chapter that entrepreneurial education will not improve the economic security of those most marginalized or create a more equitable economy. The second section illustrates that entrepreneurial education will not create more meaningful work but instead undermines our ability to create, engage in and even desire meaningful, autonomous activities, while its moralization of work blames those most disadvantaged for capitalism's insecurity and their consignment to meaningless work. To avoid a precarious future augmenting capital and its machines educators must reject entrepreneurial education in all its forms and instead promote the pursuit and mastery of activities and interests students find meaningful while providing activities to exercise and improve the civic skills and dispositions needed to create positive change. The latter must include activities and space to imagine, deliberate and debate how to implement and extend post-work initiatives such as a shortened workweek, a guaranteed income, economic democracy and an expansion of opportunities to pursue meaningful activities and participate in civic governance (Gorz 2011; Means 2018; Weeks 2011). Our response to the news that robots are taking our jobs should be to lament that it took so long, not to invent new ways to forestall human emancipation from scarcity, hierarchy and tedium.

Entrepreneurial Education Is not the Solution

Though often packaged as such, entrepreneurial education—the creation of creative, curious, agile lifelong learners, comfortable with continuous change—is not a new 'solution' to economic insecurity and inequality (Peters 2001). The United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Labour Organization (ILO), both of whom call for the creation of an 'entrepreneurial culture for the twenty-first century' (Salzano 2006: 1), and the Alberta and Ontario governments, who want to inculcate an 'entrepreneurial spirit' in youth (Ontario Ministry of Education 2016), forget that the entrepreneurial spectre has been haunting education faculties and policy circles for over three decades. Newer forms are propagated each policy cycle (e.g. STEM, 'Grit', financial literacy and coding) and give the illusion of innovation and change, but since the late 1970s politicians, mainstream media figures and education policy papers have proposed the same

progressive and conservative pedagogical strategies popular today to deal with economic insecurity borne from outsourcing and automation innovations (e.g. 'problem-solving', 'inquiry', 'interdisciplinary study', 'student choice', 'direct teaching' and going 'back to basics'). For more than thirty years, 'progressive' and conservative entrepreneurial education advocates have argued that we must shift 'the aspirations and expectations of young people' from 'security' to 'enterprise' (Ball 1989: 74–75) or from 'dependence' to 'self-reliance', to borrow from conservative entrepreneurial education advocate Thatcher (1984).

Moreover, dominant elites' efforts have not been in vain. As part of a neoliberal project aimed at extending a competitive logic and market discipline into all aspects of economic life through privatizing public services, utilities and pensions; shrinking union rolls; lowering taxes on wealth; and eroding regulations on financial institutions, entrepreneurial education has succeeded in helping shift our mindset from 'security' and 'collective responsibility' to 'risk', 'enterprise' and 'individual responsibility'. Contrary to the myth of 'coddled' youth, more recent generations are not only more competitive but overwhelmingly believe that to be financially secure one must continually learn the advanced digital, technical and social skills needed to exploit and create transient opportunities to generate wealth (Brown et al. 2010; Curran and Hill 2017; Means 2017). In Canada, the US and the UK, more workers than ever before are diligently upgrading their human capital, enrolling in post-secondary education (Community Team 2012), taking courses to learn new job skills (Horrigan 2016), learning through unpaid internships (Davies and Cresci 2017), hiring private tutors and taking 'Smart Drugs' to boost learning productivity (Saltman 2017). Further, Gen Xers and millennials are even switching jobs—not because they are easily bored, lack a work ethic or feel entitled—but because they 'fear they are stagnating and not learning anything new [at work]' (Mara Swan, executive vice-president at ManpowerGroup, cited in O'Connor 2016: para. 17). Those most inundated with entrepreneurial education believe that 'even being the best cog in a company machine puts you largely at risk… [and] building new and diverse sets of skills, learning to adapt to the ebb and flow of the economy and taking your own calculated risks… [will] make you an invaluable asset to other people, companies and organizations' (Williams 2017: para. 17).

Yet, despite this success, the more than three-decades-old project has failed to stem rising economic precarity and soaring wealth inequality. In Canada, market income fell for 60% of Canadian families between 1976 and 2010 (Rajotte 2013),[2] the 'quality' of Canadian employment (in terms of job security, wages and benefits) dropped 10% since the 1990s (CBC News 2015) and almost all of the gains in income after the 1990s accrued to the top 20% of wage earners with a third going to the richest one percent (Conference Board of Canada n.d.). In the US, median earnings for two-parent families only increased since 1975 because women now work longer hours (Greenstone and Looney 2011); seven of the ten projected fastest

[2]Contrary to the entrepreneurial narrative, it was only after *government redistribution* of income that all Canadian families experienced income gains during this period, though significant inequality remained (Rajotte 2013).

growing jobs pay less than the already low median individual income of $31,099 (Bureau of Labor Statistics 2016); and the top one percent of Americans held 39% of their country's wealth in 2017, up from 22% in the 1980s (Neate 2017). Poverty has increased for resilient, working families in the UK (Bulman 2017), while the richest one percent in the UK owned 22% of the country's wealth in 2017, up from 15% in the 1980s (Neate 2017). Most damning, though, millennials, the age-cohort most exposed to entrepreneurial education, have lower wages than the previous generation at the same age in Canada, the US and the UK, where risk of downward mobility has been increasing for four decades (Green 2014; Edwards 2017; Barr and Malik 2016). According to researchers at the International Monetary Fund (IMF), this is not an anomaly. Despite gains in 'entrepreneurialism', automation, along with outsourcing, has led to an increase in precarious low-skilled and low-paying occupations (Dao et al. 2017b) and their attendant effects across the developed world: relationship instability, workplace injury, mental health issues, indebtedness, lower levels of home ownership and reduced life expectancy (Standing 2011).

Entrepreneurial education advocates counter that financial insecurity and inequality have grown and will continue to grow because too many are not learning the right skills or dispositions, resulting in maladaptation to market needs and an inability to either obtain profitable work. The OECD voices this common lament, advising students to shift from studying business, law and administration and instead enrol in STEM courses which many assume teach the in-demand skills of the future (Rushowy 2017). However, numerous studies show that STEM graduates face similar employment challenges as non-STEM graduates and that Canada, the US and the UK, which continue to enrol record numbers in STEM courses (Thomas 2014), have a surplus of STEM graduates, many of whom are underemployed and/or could not find work in their field (Benderly 2012; Maharaj 2015; Matthews 2016). In fact, to assist STEM graduates the Canadian government created a program in 2017, paying out $73 million to STEM companies to provide work-placement opportunities for STEM students (Ballingall 2017). Although regional shortages and the need to provide additional training for job-specific skills are common, claims of widespread shortages of STEM workers are false, a finding inline with research which shows there is no significant job-skills gap but evidence of significant 'over-education' relative to available work, resulting in underemployment and job-qualification inflation (Means 2018; Brown et al. 2010).

The claim that STEM and entrepreneurial workers are needed for today's jobs is not, however, the core of entrepreneurial education advocates' argument. They are aware that there is an obvious problem with any strategy limited to copying the successful self-production techniques of high-income workers in a context in which workers vie for a fixed number of jobs; after all, if everyone obtained the STEM skills that the coveted and highly paid AI engineers at Google possess, these skills would no longer be unique and would drop in value. The core of their promise is that entrepreneurial individuals will use their STEM skills to create the new high-paying, human-capital intensive jobs of the future, which will also need to be staffed by others who also hold these skills. To the charge that 'robots are taking our jobs' they reply that the entrepreneurial will create new and better jobs. History shows,

they counter, that after innovation has rendered a job or market obsolete the endless search for profit and humans' insatiable and commodifiable needs spur the creation of new markets and production techniques and thus new jobs. Capitalism's history is a cycle of destruction and creation so we should focus on supporting entrepreneurial innovators to create and prepare for the next wave—one driven by the human qualities not yet automatable: creativity, storytelling, leadership and emotional intelligence. We might not need STEM for the jobs of today, they may concede, but we will for the jobs of the future.

Earlier predictions of mass unemployment from the spinning jenny, steam power, automobiles or mass electricity could not foresee that jobs in software engineering, personal training or Youtubing would be created. However, this time machines are not simply replacing human muscle (though they are becoming more dextrous)—they are carrying out tasks which require human intelligence, and this expands the scope of present (and future) jobs that will be automated (Frey and Osborne 2013). Routine announcements of advances in 3D printing and machine learning show that the scope of disruption is profound and that it is unlikely sufficient jobs, particularly high-paying ones, will be created (Peters 2017).[3] Here is Sebastian Thrun, a former Stanford AI professor and the creator of Google's self-driving car, on the future of coding, another valued entrepreneurial skill we are told everyone in the future will need:

> In the same way that you don't need to know HTML to build a website these days, you eventually won't need a PhD to tap into the insane power of deep learning. Programming won't be the sole domain of trained coders who have learned a series of arcane languages. It'll be accessible to anyone who has ever taught a dog to roll over. (Tanz 2016: para. 26)

Further, recent history illustrates that although tech firms generate massive share values they employ relatively few workers: in 2014, the top three tech firms in Silicon Valley, with a market capitalisation of over $1 trillion, had only 137,000 employees; in 2009, the top three carmakers in the US had a market capitalisation of $36 billion and employed 1.2 million (Wooldridge 2016). And while entrepreneurial education supporters contend that the network technologies these firms employ create a vast array of ancillary employment opportunities for digitally savvy entrepreneurs, the bulk of this work has turned out to be precarious and low-waged, as noted above.

Through improved human capitalization and optimism, entrepreneurial education advocates assume they can return us to the high growth, greater wealth equality and shared productivity gains of the post World War Two 'golden age'. However, this period was an anomaly, marked by high levels of unionization, government redistribution,[4] managed trade, limited international competition, significant avenues for

[3] Fewer jobs and more applicants would drive down wages which could arrest continued automation if human labour was less expensive than automation, but this scenario is fundamentally at odds with the vision of meaningful, well-paid work promised if we become more entrepreneurial.

[4] In fact, contrary to entrepreneurial education advocates' thesis, their valued goal of 'equality of opportunity' is strongly associated with *more* government redistribution and higher levels of job security (i.e. equality of outcome) not a population's entrepreneurial capacities and desire to take risks and learn from failure (OECD and Eurofound 2017).

productive investment and the hyper-exploitation of racialized, classed and gendered groups at home and abroad. Without countervailing measures more robust than proficiently using one's emotional intelligence to better sell commodities or advanced coding to create AI architecture, capitalism tends towards extreme inequality, concentrating wealth in the hands of fewer and fewer individuals, groups or firms who then use it to maintain/extend their advantage while offloading the costs of competition onto those with less social, political and economic power (Piketty 2014).

Entrepreneurial education thus cannot be a solution to the economic disruption, inequality and insecurity automation exacerbates because insecurity and inequality are inherent features of capitalism, the result of the competition which drives firms to grow, differentiate their products and cut costs or be replaced by competitors. In this competition, capital's human machines are both a source of value to be augmented and a cost to be minimized.[5] Automation is one of a number of technological fixes used to lower a firm's labour costs, which, when generalized, swells the entrepreneurial 'human cloud' and 'liquid workforce' vying for contingent work and drives down wages (Dyer-Witheford 2015). Entrepreneurial education promises that through constant adaptation, innovation, resilience and flexibility one's labour and, therefore, one's self will be treated as a source of unique value and so protected from becoming a cost to be automated or outsourced: the entrepreneurial worker will be free from capitalism's systemic insecurity by dint of self-fashioning and ingenuity. Yet, as entrepreneurial education advocates overwhelmingly tell us, we live in a world in which individuals must 'add value every hour, every day—more than a worker in India, a robot or a computer' (Friedman 2011: para. 5); therefore, some, often those with less social, political and economic power, are going to be financially insecure. It is logically impossible for everyone to consistently outcompete everyone else (plus the metallic scabs at the gates) and thus impossible for everyone to be protected from capitalism's 'creative destruction'. We must keep in mind, however, that it is capital and not the 'worker in India', robot or computer who threatens our financial security and that it does so by needlessly tying the outcome of this competition to access to adequate housing, food, leisure, health care and education when we could be using technological advances to provide these equitably to all.

Entrepreneurial Education Is the Problem

Many are also attracted to entrepreneurial education because it promises that the entrepreneurial will spend 'more time on higher value, human work' (Dimoff 2018: para. 15) as repetitive, boring work becomes automated, creating an 'opportunity for work to truly become a channel through which people recognize their full potential' (Leopold et al. 2016: v). The moral value of this work and waged-work in general for entrepreneurial education advocates is perspicuously illustrated by Brynjolfsson

[5] Even the worker co-operative Mondragón keeps 20% of its workforce on contingent and short-term contracts to cut costs and protect its more privileged workers (Gasper 2014).

and Mcafee (2014) who, in their book on automation, *The Second Machine Age*, argue that waged-work enables individuals to engage in meaningful activity and will stave off the anomie and corruption they believe will result if we cannot create new jobs to replace those automated. In support of waged-work's virtue they cite studies showing the detrimental effects on wellbeing from unemployment (one such study found that 6 months of joblessness was as detrimental as the death of a spouse); Voltaire's belief that without work humans would be bored and succumb to vice; a Pew survey that illustrates humanity's present and widespread desire for work; and an older Amazon warehouse worker who felt his job restored his pride. In my experience, many teachers and students similarly believe waged-work is a key means to improve oneself, a necessary marker of personal identity and a bulwark against boredom and license (the obese, chair-bound people from the animated movie Wall-E are routinely trotted out as an example of what awaits a society free from scarcity but without work).

Entrepreneurial education will not, however, create meaningful work. Offshoring and automation have been marked features of the last few decades of globalization (Dao et al. 2017a), yet much of the work replacing outsourced or automated work is precarious, offering low wages and little autonomy or opportunity to exercise and grow one's human capacities in ways one finds meaningful. This is by design. From early innovations in numerical control of machine tools to the advanced 'Digital Taylorism' of today, firms have consistently used automation to erode worker autonomy and reduce labour costs by deskilling work (Brown et al. 2010; Noble 1984). In UK skills surveys, workers document this steady erosion, reporting that they have less influence over their daily tasks in 2006 compared to 14 years earlier (Chakrabortty 2010). Work satisfaction surveys also illustrate the meaningless and limited control many feel they have over their labour: half of the 12,000 professionals surveyed by the Harvard Business Review in 2013 felt their job had 'no meaning and significance', and, according to a recent poll of workers around the world, only thirteen% of workers liked their job (Bregman 2017: para. 5). Where is the more 'human' and 'creative' work automation and improvements in entrepreneurial skills, behaviours and mindsets are supposed to create? And how can meaningless work that offers little opportunity for autonomy be virtuous, particularly when it recreates a system which produces vast inequality and insecurity?

More troubling than this alienation, though, are entrepreneurial education advocates' efforts to align our interests and moral sensibilities with capital accumulation. Vrbanac (2015) provides a typical example, complimenting initiatives which promote financial literacy for kindergarteners and coding for primary school, writing that parents should send their children to entrepreneurship and financial literacy camps because the 'summer camp experience… shouldn't just be a week off where the kids get out of their parents' hair', but 'should inspire them to think of what they might want to do in the future' (para. 10). Entrepreneurial education advocates tirelessly encourage older students to independently align their interests and skills with capital's needs, touting the benefits of myriad education 'innovations' such as the 'entrepreneurial passport', which encourages students to pursue, monitor and document their attainment of the skills, behaviours and activities that promise to

boost their productivity and better signal to employers their potential value (Ball 1989; Young 2014), or the personalized training platforms offering an 'unbundled' or 'netflixed education' to teach the particular skills employers demand (Craig 2015; Roberts-Mahoney et al. 2016). The culmination of this project is the entrepreneurial individual who shapes his or her interests so they can be used to better grow the entrepreneurial capabilities capital needs, an aim Kamenetz (2015), a financial literacy advocate, presents as wholly beneficial, writing 'constantly updating and maintaining one's skills… becomes much easier if you have a genuine sense of interest in what you're doing' (para. 10).

Though one is more productive if intrinsically motivated, this alignment encourages individuals to limit the range of meaningful activities and interests they can pursue to those that add to their human capital. This problem is particularly acute in the case of entrepreneurial education advocates' reduction of education and progressive pedagogy to a means for learning the skills and dispositions AI has difficulty acquiring. Instead of valuing and expanding educational practices and institutions which can assist students to engage in a variety of intrinsically meaningful non-economic activities and better participate in meaningful political decision-making, entrepreneurial advocates call for further economization of education, arguing that the Arts and Humanities offer untapped potential for creating an agile, problem-solving, competitive and entrepreneurial workforce. In lieu of STEM, they offer up STEAM to extract value from disciplines which could offer a critical purchase on their rapacious project as well as the means to imagine, debate and experiment with alternative visions of the future. Contrary to entrepreneurial education discourse, our problem is not how to encourage the alignment of meaningful activities and interests with waged-work, human capital building and the generation of economic value. Instead, the problem is that without alternatives to meaningless work and after being inundated for over three decades with the message that one cannot take 'a week off' in the entrepreneurial contest too many cannot envision, desire or work with others to create more just alternatives, even if they find their work meaningless. This is only made worse by entrepreneurial education advocates' routine conflation of political action with a 'social entrepreneurship' that assumes every political problem has a commodified technological fix.

Entrepreneurial education's most perverse 'success', however, is that its individualization of capitalism's systemic insecurity and moralization of waged-work and human-capital building encourages individuals to blame themselves and others for the meaningless work and insecurity which are necessary byproducts of capitalism. This cruel discourse of personal responsibility—primarily used to castigate the marginalized people entrepreneurial education advocates desire to help—is explicitly endorsed in conservative entrepreneurship education discourse, but progressive entrepreneurial advocates are not without fault. Behind the social justice tropes and optimistic veneer, the 'progressive' entrepreneurial education discourse has the same core message as its conservative counterpart: 'learning is no longer a luxury, it is a necessity', and everyone is responsible for his or her financial independence and ability to improve his or her competitive capabilities (Schawbel 2017: para. 21). Institutions, the status-quo and teachers' low-expectations are routinely

given a rhetorical thrashing in 'progressive' entrepreneurial texts, but they are clear that our collective responsibility is exhausted once students are provided with the necessary entrepreneurial education. After this, it is the student's responsibility to make and remake him or herself into an effective entrepreneurial competitor who can 'find a way to add value in a way no one else can' (Friedman 2011: para. 10). For entrepreneurial education advocates of all stripes it is ultimately the individual, provided with the minimum necessary opportunities to build his or her entrepreneurial capabilities, who is responsible for him or herself, a message which is tragically correlated with generational increases in depression, suicide ideation and anxiety in the UK, Canada and the US (Curran and Hill 2017) and will not be solved by adding 'mindfulness' or 'wellbeing' to the entrepreneurial education project.

Many entrepreneurial education proponents cannot see the purposeless harm to which they contribute. They assume waged-work is timeless and necessary, and so to them it makes sense that automation is an existential threat requiring we contort ourselves to be of use to machines and capital in a way they hope is meaningful and fulfilling. The MIT professors, Brynjolfsson and Mcafee, suffer from this historical and imaginative myopia, pointing to the pride felt by a warehouse worker engaging in precarious, low-waged and heavily surveilled work as evidence of the need to create the waged-work robots cannot do. Yet the predominance of waged-work and the view that it is a virtuous means through which to exercise and grow one's human capacities are recent phenomena. The ancient Greeks, for example, derided waged-work as detrimental to one's more human and public life while Adam Smith (1776/2003), no enemy of the market, wrote that public education was needed to counter the detrimental effects of modern work processes on workers' mental faculties and character. In significant contrast to today, many workers in capitalism's early days viewed waged-work as akin to slavery (McNally 1993).

Brynjolfsson, Mcafee and too many others have forgotten that we created the necessity to engage in waged-work and the culture which values it and that we are doing so long after we have attained the technological means and knowledge to create the productive and distributive systems necessary to reduce work and equitably provide the basic goods and services and wide range of meaningful activities needed for everyone to live well (Gorz 2011; Means 2018; Weeks 2011). To create an alternative to our endless cycle of work and manufactured insecurity and consumption we must shift our mindset from the zombie idea that human capital, apps and optimism can create meaningful activities and economic security for all and that any criticism of capitalism's drive to accumulate misunderstands 'human nature' or that any alternative to capital's necessary exploitation of human labour leads inexorably to the Gulag. Instead, we need to think how we can better support radical, innovative experimentation with post-work reforms such as a guaranteed income, reduced workweek and economic democracy to create a more secure, equitable and just twenty-first century. Entrepreneurial education is not a solution to twenty-first-century problems; it is the problem and must be replaced by an education which can help envision, create and prepare students for a post-work future.

Conclusion

Recently, an internal shareholder report at Goldman Sachs made headlines for noting that advances in biotechnology and gene therapy-posed concerns because they could possibly cure an increasing number of diseases. The report noted that 'while this proposition carries tremendous value for patients and society' it challenges a sustainable business model that profits from the selling of 'chronic therapies' which do not cure diseases or reduce the risk of virus transmission (Scaggs 2018: para. 5). Though roundly criticized, this logic shapes all forms of entrepreneurial education, which in turn limit the future we could create with our technological innovations. Curing illnesses and developing automation that reduces our need to work and scales back hypercompetition are not 'sustainable business' practices. Customers/patients must be continually created and workers must endlessly strive to accumulate capital and recreate a system of social relations in which many have little option but to perpetually reconfigure and upgrade themselves to stay ahead of their competitors. For all its rhetoric about promoting 'thinking outside the box' and problem-solving for problems that do not yet exist, entrepreneurial education limits our thinking, imagination, ethics and creativity to ensure the continued accumulation of capital and the reproduction of exploitative class relations.

The crisis we face is thus not that robots are taking our jobs but that we are trapped spending most of our time reshaping humans to be of use to a system that no longer needs many of them. We must recognize that we are responsible for our future and support an education which can help us harness our immense productive capacity and advances in automation to free everyone from economic insecurity and the need to engage in meaningless work accumulating capital. This does not mean that we no longer teach or promote STEM, resilience or problem-solving. It means that students learn STEM, resilience, problem-solving and innumerable other skills, dispositions, concepts and facts through an education which has two interrelated aims: the growth of human capacities for their own sake through the pursuit of artistic, intellectual, emotional and physical activities each student finds intrinsically meaningful and the exercise and development of individuals' civic skills through participating in school governance; critically analysing the discursive and material means through which inequities are produced; and contesting and experimenting with possible solutions alongside others outside school. Untethered from the ideology of work, education can prepare us to create and participate in a world in which the secure, full and free development of the individual, not the creation of more waged-work, is the measure of success.

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Chapter 7
Technological Unemployment and Psychological Well-being—Curse or Benefit?

Neil Frude

A Future Without Work?

Formal employment is not part of the natural order. We didn't evolve to work in offices or on assembly lines. In terms of human history such employment is a relatively recent development but, within recorded history, work has been a major factor determining people's quality of life and the structuring of society. Some people have worked to produce goods or provide services on a self-employed basis but many have been employed by others and either paid for the work they do or held in slavery. Governments have devised complex legislation to specify and support the rights and duties of employers and employees, and governments have themselves acted as major employers. A major element in economic policy has been the desire to maintain a high level of employment, and changing employment levels have long been taken as a measure of economic success and of how well a country is being governed. For most people, paid employment has been the main way of receiving the finances they need to provide food and shelter for themselves and their family. It has also determined the way in which they spend a substantial proportion of their time and has, for many, shaped their identity and status as well as having profound effects on their self-esteem, their aspirations and their physical and psychological well-being.

Article 23 of the United Nations Declaration of Human Rights states that: *'Everyone has a right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment.'* However, many people now believe that within the foreseeable future paid employment will cease to be the norm. Intelligent machines have many obvious potential advantages over human workers, including added precision and reliability, instant replaceability, wide adaptability and 24/7 availability. Although there is widespread belief that intelligent automation

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will lead to the wholesale loss of employment opportunities for masses of people, there is not total consensus on the issue. Several dissenting voices have pointed out that engineering and technological innovations have always generated alarming predictions of mass unemployment but that such consequences have never materialized. These commentators argue that emergent technology has always led to the creation of at least as many jobs as have been lost. If this point is conceded, the issue becomes whether the imminent industrial revolution powered by AI and robotics is 'just another technological advance', similar in this respect to what has gone before, or is, as many claim, in a very different league. The crucial difference, it can be argued, is that whereas previous developments involved new types of machinery requiring new kinds of skilled operators, the 'machinery' envisaged for the next few decades will operate virtually autonomously, and will therefore require little human input, at least once it is 'up and running'.

In his book *Homo Deus: A Brief History of Tomorrow*, Harari (2016) firmly rejects the idea that imminent developments in AI and robotics will naturally lead to the creation of replacement jobs. He points out that nineteenth-century industrial developments created a new class, the urban working class, and suggests that imminent technological developments will also create a new class, but that this will be 'the useless class'—unemployed and unemployable.

A further argument advanced by those who challenge the idea that 'new technology will lead to mass human redundancy' is that many jobs are 'essentially human' and could never be replaced by artificial systems. They point to jobs that involve social skills, interpersonal warmth, empathy, compassion and a 'personal touch'—all of which characteristics, they argue, will never be emulated by an artificial system no matter how intelligent it might become. This argument, however, is unconvincing. Side-stepping the complex and highly contentious issue of whether a machine could ever feel empathy or be truly compassionate, there can be no doubt that artificial systems can emulate such characteristics and that many people find machine simulations of 'emotions' and 'personality' attractive and beguiling (Frude 1983; Donath 2004; Frude and Jandrić 2015). Several robot products are available that provide 'company' for older adults with dementia, for example. These are currently in the form of responsive and speechless furry animals, but we can certainly foresee how these will evolve with speech skills, a wider capacity for interaction, and an endearing artificial personality (Fasola and Matarić 2013). The long history of attraction towards and 'social engagement' with artificial objects that simulate living creatures (including dolls, puppets and automatons) has shown how readily people engage in a quasi-social way with such artefacts (Frude 1983, 1984; Frude and Jandrić 2015). This psychological readiness to be attracted to artificial systems that appear to have emotions, interests and motives seriously challenges the suggestion that service-based jobs will largely remain protected from takeover by artificial systems. A number of current projects are aimed at developing robots as carers and companions and we can be assured that sterling efforts will be made to equip such artificial systems with the means of simulating empathy, compassion, concern and a good sense of humour.

So, despite differences of opinion regarding the likely nature, extent and speed of change, few would deny that technology will have profound effects on the demo-

graphics of the workforce within the foreseeable future. It is highly likely that within a few decades the size of the human workforce will be greatly reduced and that paid work will be unavailable to most people. This chapter concerns the likely psychological effects of non-employment in a context in which the majority of people do not have jobs. The main question to be considered is: 'In a lifetime without paid employment, will people suffer psychologically, or will they be able to maintain their well-being and even thrive?'

A variety of utopian and dystopian visions of a future with mass non-employment can easily be portrayed, some of them extreme. Much of the variation between such portrayals reflects the influence of situational factors, including ecological, economic and political. In a world of extreme global warming and extreme pollution, with extreme poverty as the norm, life without work would be dire. But in a temperate and 'green' world, with the population well supported and having free access to a myriad of resources, life without work could be extremely pleasant.

Income is clearly an extremely important contextual factor. Without any employment income, how will people be able to afford food and shelter and how will they pay for access to resources that would enable them to maintain at least a reasonable quality of life? There is already a widespread debate concerning the advisability and economic feasibility of a 'universal basic income' or 'basic income guarantee' (Sheahan 2013) and there are suggestions that many resources that enhance quality of life, including the arts and adult education, and the use of gyms and leisure centres, should be made available at minimal cost or no cost. It has also been recognized that if the robot-powered economy is to thrive people will need to be able to pay for the products the robots are making and to pay for the services that robots are providing.

The Benefits of Work

Work is currently a major factor contributing to people's quality of life and well-being. The majority of adults spend a substantial proportion of their lives at work, many invest heavily in their careers, and social identity and social status are often closely related to a person's job. *'What do you do?'* is often a way of asking *'Who are you?'*. The work environment triggers strong and varied emotional responses, both positive and negative. It often stimulates feelings of pride and satisfaction, for example, but it may also trigger frustration and disappointment. Work can be elating, but it can also provoke anger and anxiety and it is very often stressful.

It has long been recognized that work provides people with a wide range of benefits quite apart from financial income. These benefits include a means of occupying time and structuring the day and week, frequent opportunities to engage in rewarding physical, cognitive and social activities, opportunities to use existing skills and to develop new skills, regular social contact, recognition and support, social status and a sense of identity, and membership of a team and a wider organization.

Work and Well-being

Two important components of subjective well-being are the experience of positive emotions (this is the labelled the 'hedonic' aspect) and a sense of meaning and purpose (this is the 'eudaimonic' aspect). It is clear that paid employment can contribute to both of these components in a number of ways.

Work can be a pleasant experience. Many people say that they positively enjoy their working life and that their work is a source of many positive feelings including those of engagement, interest, fun, pride, satisfaction and achievement. Indeed, for many people, working life is their predominant source of positive experiences. A classic study of people working in Chicago, for example, found that the average worker had more positive experiences at work than in leisure settings (Csikszentmihalyi and LeFevre 1989).

Working life also constitutes a substantial part of the social life of many people, and for some people the workplace provides the nearest thing they have to a community. Indeed, the value of working as part of a team, of companionship in the workplace and of camaraderie with colleagues, may only be fully appreciated when these are lost, for example when the person loses their job, retires, or begins working from home.

Work also provides many people with added meaning in their life, and a strong sense of purpose, thus making a valuable contribution to the eudemoniac aspect of their sense of well-being. Employment often involves tasks that are intrinsically rewarding and satisfying and that also have a clear and worthwhile purpose. Any work that is judged to be totally lacking in worthwhile purpose may be experienced as 'soul-destroying' (Graeber 2018). Some projects are ambitious, challenging and exciting to work on, and these can provide a sense of 'mission' that is highly inspiring. The successful completion of such a project is likely to trigger strong feelings of achievement and may stimulate feelings of pride in the individuals and the teams responsible for the success.

People often place great value on the work they do, and as a result their work contributes markedly to their overall sense of purpose. Positive psychologists sometimes distinguish between 'a job', 'a career' and 'a calling' and associate 'a career' and—especially—a 'calling' with a high level of 'meaningfulness' of the employment. The distinction relates to work attitude rather than to the intrinsic nature of the employment, and although the 'calling' orientation is often associated with 'vocational' professions such as teaching, nursing and medicine, people in unskilled and low paid jobs may also have a sense of 'calling', particularly if they recognize the part their own work plays in making a contribution to a significant project (Achor 2010). Thus, famously, a janitor working for NASA in the 1960s, asked about the job he did, said that his job involved helping to land a man on the Moon.

There has recently been a good deal of interest in the experiences that contribute to 'A Good Day at Work' (GDAW) (Robertson 2017). Studies in the field have identified the elements associated with such days, and these include both hedonic and eudemoniac components. Significant factors linked to a GDAW include high

levels of work engagement and absorption; achievements with respect to challenging tasks; work being judged as meaningful, creative and inspiring; a sense of vitality; good social relationships with colleagues; and work being varied in nature. A GDAW typically involves the experience of a number of these elements during the day, and people who have a substantial proportion of GDAWs tend to be highly energized. They enjoy their working life and they work well. There is a clear win–win situation, with significant health and well-being benefits for the individual as well as substantial benefits for the organization in terms of productivity and profit (Robertson 2017).

Of course, many people also experience bad days at work, at least occasionally, and for some people the working day is often unrewarding or positively stressful. Some jobs are highly repetitive, boring and totally uninspiring, whereas others make unbearable demands on the worker and are experienced as toxic social environments. Many people find that their work situation brings them down, reducing their subjective well-being, and in many cases work inflicts significant damage on people's mental and physical health.

The evidence is very clear that many people find their work highly stressful and that work environments often precipitate mental health problems (Health and Safety Executive 2018; Royal College of Psychiatrists 2018) A 2016 survey by the UK Chartered Institute of Personnel and Development (CIPD 2017) found that a third of people in employment were experiencing mental health problems, including depression, stress and anxiety, and they quoted evidence to show that in many cases it was the work situation itself that had generated these problems.

So, many people find their work to be highly stressful. As well as having a strong negative impact on employees and their families, employee stress also has a major effect on companies (in terms of increased employee absence, staff turnover, etc.) and on the national budget (calculations consistently show that employee stress exacts a very high cost on the economy—European Agency for Safety and Health at Work 2014).

So working life is a challenge for many, and in a number of cases it inflicts severe and long-term damage. But despite the fact that a significant proportion of people are psychologically damaged by the work they do, the overall average effect of work on well-being remains substantially positive. The profound variation in the effects of employment can be understood as the result of differences between people (especially, individual differences in resilience, Bennett 2015) and, in particular, differences in the nature of particular jobs, in work ethos and in specific work practices.

Many people believe that work makes a net positive contribution to their happiness and many people carry on working when they have no financial need to do so. Many voluntarily extend their working life for many years after they could retire in comfort, and even some people who are extremely rich—including some well-publicized lottery winners—choose to carry on working. Such people make the assessment that, overall, work is good for them, and they certainly take the view that work is about much more than 'earning a living'.

The Costs of Unemployment

There can be little doubt that becoming unemployed and being out of work are highly significant factors contributing to poor well-being and mental ill-health (Pevalin and Goldberg 2003; Paul and Moser 2009). The association between unemployment and poor mental health is very strong, and although in some cases emotional difficulties lead to the loss of employment, the evidence indicates that most of the association is due to a major negative impact of worklessness on mental health. A report by the Royal College of Psychiatrists (RCP 2018) says: 'The figures are stark: people who are unemployed for more than 12 weeks are between four and ten times more likely to suffer from depression and anxiety'. It is also the case that unemployed people have poorer physical health and that they have higher death rates than those who are employed.

In a meta-analysis of over 300 studies of the effect of unemployment on mental health, Paul and Moser (2009) found significantly higher psychological distress in unemployed people, compared to people in work, on measures of depression, anxiety, psychosomatic symptoms, subjective well-being and self-esteem. Over twice as many unemployed people (34%) had significant clinical problems as those who were employed (16%). Unemployment had stronger negative effects on men than on women, and more negative effects on blue-collar workers than on white-collar workers. The negative effect of unemployment on mental health was stronger in countries with unequal income distributions. Statistical analysis of longitudinal studies indicated that unemployment is not only correlated with distress but also causes it. This comprehensive study also provided evidence that intervention programs were moderately effective in reducing unemployment-related distress in people unemployed for a long period.

Retirement

It might be suggested that the ill-effects of unemployment are restricted to unemployed people of working age who are seeking work, who are likely to be living on a low income and are likely to compare their own situation with that of their peers who are in employment. Maybe this type of unemployment doesn't provide an appropriate model for a future in which non-employment has become the norm, in which those not in employment regard their situation as permanent, in which they receive financial support from the state, and in which non-employment is not stigmatized and has become the situation for almost everyone. It might be suggested that voluntary retirement in older age can provide a more relevant model for the future effects of non-employment than contemporary involuntary working-age unemployment.

So what are the well-being and health effects of voluntary retirement? They do appear to be considerably more variable than the effects of general unemployment, and it is certainly the case that many retired people are extremely happy with their

lifestyle. However, the research indicates that, overall, retirement has a substantial detrimental impact on both mental and physical health. A study carried out by the Institute for Economic Affairs (IEA) in the UK suggested that people often experience increased well-being for a short period immediate after retirement, but that in the medium and longer term retirement leads to a highly significant decline in health. This is the case for both men and women. ('*Work Longer, Live Healthier: The relationship between economic activity, health and government policy*', Sahlgran 2013).

The IEA study indicated that retirement decreases the likelihood of being in 'very good' or 'excellent' self-assessed health by about 40% and also increases the probability of suffering from clinical depression by about 40%. As the length of retirement increases, things become worse. A doubling of the years spent in retirement decreases the likelihood of being in 'very good' or 'excellent' self-assessed health by around 20% and increases the probability of suffering from clinical depression by 17%. It should be noted that the study took into account the possible effects of confounding variables, including increasing age. Thus, the results compared people who were retired with people of the same age who were still working. The analysis also ruled out the possible explanation that these patterns could be accounted for mostly by the fact that people who are unwell may choose to retire at a relatively early age. The report concluded that working longer helps people to live healthier lives. It recommended that people considering retirement should think very hard about whether this really is their best option and that extra support should be given by employers and government to those who wish to carry on working beyond the normal retirement age.

So not being in employment, whether this is due to involuntary unemployment or voluntary retirement, is detrimental to people's health and well-being. The causal pathways are unclear, but it is likely that the effects are due to, among other variables, financial constraints, less social contact, loneliness, boredom, loss of 'purpose', loss of time-structure and, in some cases, less physical exercise. It is clear that these deficits are broadly the reverse of the established benefits of working.

Maintaining Psychological Well-being

The fact that working life promotes well-being and health, and that unemployment is often damaging to well-being and to physical and mental health, might well suggest that large-scale non-employment resulting from developments in AI and robotics will lead to wholesale misery and ill-health. This is, indeed, one potential scenario. Appalling consequences might be expected if the large majority of the population lacked the structure and the demands that come from working life. Work commitments now provide many people with a well-defined contextual frame, occupying much of the waking day, structuring weekly life, regulating behaviour and presenting a constant series of goals, challenges and incentives. Paid employment provides opportunities for being creative, for developing skills and for collaborating with other people. Without this, many people would certainly have a good deal of time on their

hands. Some would regard such a work-free scenario as ideal—endless leisure time, a perpetual holiday, no work-based stress and few demands. For others, however, the vision of decades of non-employment would be extremely alarming. Even if financial hardship were not an issue, such a life might be seen as endlessly boring, somewhat lonely, lacking structure and purpose, and maybe even pointless.

We can consider how the negative effects of unemployment might be avoided and how benefits similar to those gained from employment might be obtained by people who are not employed. The issue might be posed in the following, very general, way: *'How can people be happy when they don't have a job?'* One way to approach this is to consider the aspects of working life associated with 'A Good Day At Work' and then to think about how such elements can be replicated or substituted for in a non-work situation (so that people have a GDWW—a 'Good Day Without Work'). Another strategy is to think more broadly in terms of what generally enables people to flourish and thrive and then to consider non-work-based strategies to promote such beneficial effects. Whichever of these two approaches we take, we are likely to find many useful ideas in the field of positive psychology (Lyubomirsky 2008; Seligman 2011; Hefferon and Boniwell 2011).

Positive Experiences

Work, for many people, generates frequent positive experiences (Robertson 2017). There is likely to be 'a lot going on' and at least some of this will have a positive impact. Success in a task, a pleasant social exchange with a colleague, and interesting and engaging work tasks may generate positive feelings, and experiencing a number of such minor uplifts may well contribute to a Good Day at Work. In the workplace, many small uplifts are likely to happen spontaneously, as part of the everyday scene. However, to have a Good Day *Without* Work the person may need to deliberately engage in activities that will generate positive feelings.

Some people are well aware of particular activities and circumstances that will generate positive feelings and give them a substantial 'uplift'. They know what they can do to trigger a sense of pride, elation, satisfaction or awe. Such awareness constitutes a key aspect of 'emotional intelligence' (EQ). Other people are less insightful, but positive psychology has demonstrated that people are well able to learn behavioural strategies that will enhance and sustain their happiness and enable them to flourish (Bolier et al. 2013).

It is hardly rocket science to say: *'If you know of an activity that makes you feel good, do it more often'*. If you enjoy baking, do more baking, if you enjoy playing tennis, play more tennis. If you enjoy seeing films, go to the cinema more often. But some people have very little insight into the events and circumstances that affect them emotionally in particular ways. They may be unable to think of anything they could do to that would stimulate a feeling of pride, for example, or would lead them to experience a deep sense of satisfaction or joy.

Structured Time and Engaging Tasks

Working full-time—'9–5', five days a week—does a great deal to organize people's time and to structure their week. It's similar for those in full-time education and indeed for those heavily committed to a timetable of religious practices. But people who are unemployed or retired, who don't have children to take to school and who don't engage in regular religious practices, will typically lack such structure and rhythm to their days and weeks.

Another major difference between people who are employed and those who are not involves what might be referred to as 'diary density'. People who are employed are typically 'busy' and indeed they may sometimes have so much in their work diary that they feel overwhelmed. By contrast, those who are not in employment may feel that they have 'too much time on their hands'. With very little in their diary, they may have very little to do, to plan for, to look forward to, to feel challenged by, or to later look back on with a sense of achievement. Such people are likely to become bored and frustrated, and they may also become irritable and depressed.

In my practice as a clinical psychologist, I sometimes point out to clients that there are 168 hours in a week, and if we assume that 68 hours may be spent asleep or in the bathroom, that leaves 100 waking hours a week to fill. And, for many people, the task of filling that time is truly formidable. Some who are not in employment have no problem occupying their time in interesting and worthwhile ways, and they find it easy to organize a timetable that keeps them relatively busy, stimulated and energized. Hobbies, participation in regular group activities, learning new skills and engagement in personal projects are some of the ways in which non-employed people manage their time so that they maintain a high quality of life without the tedium that often comes from an 'empty diary'. Thus many people approach retirement, for example, with well-developed plans for occupying their days. They may look forward to taking up fishing, gardening or knitting, to joining a choir, enrolling in education classes (often involving language learning or creative arts) or engaging in various forms of volunteering. People who respond to retirement by conscientiously adding events and activities to their diary often claim that they are busier in retirement than they were when they were working, but they may add that being informal and self-directed, their current 'busyness' is free of stress.

As well as taking care to maintain an optimal 'diary density', such people may also structure their planned activities so that each day includes a number of pleasurable activities (but not too many) and so that there is considerable variation between days. They may consciously build in a weekly routine to replace the weekly pattern previously imposed by their employment. Thus some people naturally engage in what may be labelled 'Active Diary Management' (Frude 2014). I often introduce this idea to clients as a way for them to enhance and maintain their well-being, and in many cases the use of simple Active Dairy Management strategies has helped people considerably, enabling them to significantly enrich their lifestyle.

Social Contact

Regular contact with colleagues is one of the things that people miss most about not working. This includes both collaborative working on projects and the informal banter, cut and thrust and 'soap opera' aspect of working life. Of course, when they are not working people have much more opportunity to interact with their family, but many people greatly value contacts beyond the family circle. In many cultures, the nature and shape of communities has changed markedly, and many people now have few contacts within their neighbourhood who they would describe as 'friends.' It may take considerable effort to ensure an optimal level of regular social contact, but many communities do have resources such as reading groups, choirs, sports teams, religious groups, etc. that can help in this respect. Thus the kind of social stimulation that is often taken for granted in the workplace may need to be deliberately engineered when the person doesn't have a workplace. People make great efforts to organize major projects such as buying a house or planning a holiday, but they are often passive when it comes to the more general aspects of how they live. Many people would never regard redesigning their lifestyle as a project that might benefit from strategic thinking and planning.

Goals, Meaning and Purpose

For many people, employment is much more than a way of earning money or occupying their time. It is not just a means to an end but is a valuable and highly valued end in itself. And for some, it provides at least part of the answer to the question of what life is really about. Historically, there has been an emphasis on the morality of working hard, on the dignity of work and on the duty to find and hold on to a job. In line with these ideas, those of working age who are unemployed have been variously pitied or scorned. And many people regard their working role as a vital part of their identity. What they 'do' affects their own perception, and other people's perception, of who they are. Without their work role they might feel that a part of them, at least, was missing. And, of course, for many people, work is their most frequent reason for getting out of bed in the morning, both literally and figuratively.

A Traditional Happiness Formula

A simple, traditional, formula for happiness suggests that three things are necessary for a person to be happy—(a) something to do, (b) something to love and (c) something to look forward to. Work certainly provides people with 'something to do' and in many cases it also provides 'something to love' because for many people work is an important source of inspiration and a focus of their enthusiasm. Finally, sev-

eral aspects of work—such as the prospect of undertaking interesting, novel tasks, of successfully completing challenging projects, and of workplace promotion—can give people much to look forward to.

Those who are not in work may (a) not have much to do (they may find it difficult to fill their time with significant or rewarding activities), (b) have nothing to love (i.e. lack the passion and inspiration that can come from work involvement) and (c) have little to look forward to (i.e. by having fewer things that stimulate positive anticipation). However, paid employment is not the only source of these three elements. There are many other ways and contexts in which people can (a) find rewarding and engaging ways of occupying their time, (b) realize and develop particular enthusiasms and passions, and (c) identify and plan activities they can anticipate with relish. Many people, whether or not they are in paid work, derive such benefits from being engaged in an educational course, for example, or by pursuing hobbies or volunteering. Some people have a passionate interest in sport and look forward to the next event involving their favourite athlete or football team, while others look forward in anticipation to an upcoming film, holiday or music festival.

It is clear that while non-employment often has strong negative effects on people's well-being and health, some people are knowledgeable enough and resourceful enough to buck the trend and to thrive despite the fact that they are unemployed or have retired. Clearly, there are lessons to be learned from such people, and there is every possibility that those lessons can then be taught to others.

And technological developments may prove a major asset in helping people to thrive through their non-employment. In the next section, we will explore some of the ways in which the new AI and robotic technology, the very developments that precipitated the problematic issues we are considering, may possibly contribute towards a solution. AI and robotics may guide individuals towards increased self-knowledge (in terms of their interests, values, strengths and skills) and help them identify the activities that will most effectively help them to flourish without work. Having contributed to something of an existential crisis for many people, it is appropriate that AI and robotics might be employed to help people towards increased self-awareness and to greater health and happiness.

Technology as a Well-being Resource

If the prevailing political climate ensures a reasonable distribution of economic resources, it would certainly be possible to compensate for the range of psychological losses incurred by worklessness. Indeed, it will be suggested that the quality of people's lives could be substantially better without paid employment, especially if they are helped by imaginative innovations involving AI and knowledge drawn from psychology in general and from positive psychology in particular. It is suggested that the imaginative application of AI to the task of promoting human well-being by encouraging people to engage in uplifting activities could bring huge benefits in

terms of health and well-being and that these could be delivered without the damaging pressures and stresses that affect so many people in today's workforce.

Some people already manage to thrive while unemployed or retired. They have found various ways of living a pleasant and fulfilling life without work. Very few of these people are content merely to 'do nothing'. Many engage in self-initiated tasks and projects, some of which may be quite ambitious. In effect, these people create their own unpaid jobs, inventing their own goals and scheduling tasks that keep them fully occupied. By setting themselves specific challenges, such people can look forward to celebrating successful achievements. Other people become involved in communal projects and benefit from working with others towards a common goal. Such activities provide them with a source of regular social interaction. And other people are happy and content simply to engage in pastimes such as walking, reading, gardening, knitting and playing chess. Regular engagement in such 'slow pursuits' is sufficient for some people to feel that they are getting the stimulation they need and that they are 'living life to the full'.

So some people do manage very well and flourish in the absence of work, but it is clear from the evidence reviewed earlier that such people are in the minority. The research shows that most people do not flourish when they are not in paid employment. Many people who are not in work do not engage in activities that they find sufficiently interesting and meaningful to compensate for not having a working life. As a result, they often become bored and frustrated, and may also become angry and depressed. It is clear that the majority of people who are not in employment do not experience their abundant leisure time as a source of joy and that many find the task of filling their 100 weekly waking hours truly daunting!

This suggests that many people would benefit from effective guidance on how they could spend time doing things that they not only find pleasurable and rewarding but also judge to be meaningful and valuable. Effective guidance should mean that people would come to regard much of their time as 'quality time' rather than as 'wasted time'. The fact that people differ in their aptitudes, their interests and their values means that the appropriate guidance would differ greatly from one person to another. Just as 'careers guidance' assesses people's skills, interests and attitudes and then uses the available data to suggest possible jobs that the person might find conducive, so 'activity guidance' could explore key aspects of the person's psychology, including their values, attitudes, strengths, interests and talents, and then suggest specific activities that the person would be likely to find engaging and fulfilling.

A vast range of digital material is now readily available and easily accessible. The resources offered online, often at little or no cost, can cater for practically everyone's tastes and preferences. The web provides a vast and ever-growing multimedia jukebox and new developments in media, including virtual reality, are waiting in the wings. Given the almost infinite array of easily accessible and potentially highly engaging digital resources, how could anyone ever be bored? Several factors provide the answer to this question. One is that many digital resources invite a passive response whereas people are rarely content to be passive for long periods of time. They prefer to be active agents operating and controlling things in the world (and, arguably, operating a remote control and clicking a computer mouse don't count as 'activities' in the current

sense). Another factor relates to the fact that, although digital resources constitute a super-abundant treasure chest, it can be difficult to locate the best personal 'jewels', especially if you are not sure what these might look like. Many people are not aware of the existence of whole areas of resource that could have a remarkable positive impact on their life.

So guidance could certainly be helpful, and to a limited degree this is already available. For example, rather than simply leaving people to stumble upon a new seam of interesting and enjoyable material just by chance, music and video streaming services typically note the user's viewing or listening history and use this to recommend 'other products you might also like'. Such recommendations are not based on judgements made by human operators but simply reflect the patterns of other users' previous choices. This simple 'nearest neighbour' strategy can, however, be highly effective in extending a person's awareness of things that they greatly enjoy and come to value highly.

Another strategy that can be also used to identify whole new areas of 'liking' and 'uplift' involves assessing a person's interests, values, beliefs and personality and then using a series of algorithms to suggest activities that the individual would be likely to enjoy and find meaningful. Such 'psychographic' strategies are already used in commercial enterprises to target advertising and, highly controversially, they have also been used to target political messages in election campaigns in order to influence people's voting behaviour. The suggestion here is to use a similar strategy, but at the person's own request, with their full knowledge and active involvement, to guide them to specific ways of managing their lifestyle in order to achieve and sustain high levels of well-being and to promote both their physical and their emotional health.

Effective careers guidance has helped many people avoid years working in jobs that don't suit them, while also helping people to identify highly suitable jobs that they would otherwise not have considered. In the same way, effective activity guidance could direct people towards leisure activities that would be life-changing, enhancing their health and well-being in many ways. In addition to traditional data acquisition methods of the kind used in careers testing—interviews and psychometric tests of aptitudes and interests—many additional techniques and technologies could be used to gather and analyse data that would guide people in useful directions. Psychological techniques that explore people's implicit attitudes (Greenwald et al. 1998; Ogunnaike et al. 2010) and that link personality factors to artistic and musical taste (Rentfrow et al. 2011) could identify novel areas of activity and interest. In addition, various biomarkers could be used to monitor people's responses (including their anxieties, enthusiasms and preferences) to an extremely wide range of sample stimuli. As well as psycho-physiological measures that have been used for decades (including those of skin conductance, and variations in heart rate and vagal tone; Fredrickson 2013), real-time neuroimaging techniques will be able to detect personal preferences and attitudes, thus providing new forms of 'mind-reading' and 'mind-mapping' (Kay et al. 2008; Chikazoe et al. 2014). Data collected from individuals using such techniques could then be analysed against masses of 'big data' from thousands or even millions of other people. Such assessments could be extremely beneficial, but it is also easy

to see how these forms of data gathering could be abused, and for this reason the process would have to be careful regulated by appropriate legislation.

As things stand now, few people ever give serious consideration to more than a tiny fraction of the activities that might add to their enjoyment of life, engage their interest and allow them to make use of any hidden talents. For example, millions of people with a strong creative talent will never have engaged in any form of creative activity. How many people with a gift for writing have never considered producing a poem, a novel or a play? How many potential athletes have never thought of training? How many people with the potential to become a fine classical violinist, jazz saxophonist, or rock drummer have never laid their hands on the instruments on which they would excel? It is sad to realize that a vast number of people, possibly the great majority, get to the end of their life never having discovered whole swathes of activities that would have brought them intense pleasure, engaged them at a deep level and given them a profound sense of fulfilment. We sometimes hear about people who discover their outstanding talent for writing or painting when they are in their 70s or 80s and manage to produce a small body of excellent creative work. There must be many whose talents remain forever undiscovered.

A comprehensive series of enjoyable and stimulating online tests could be used to establish a person's current profile of interests, talents and enthusiasms, and then to further assess their potential to develop further specific interests, enthusiasms and skills across the broadest possible range of areas and activities—from archery and archaeology to zither-playing and zen. Following such an assessment, the person would be gently guided and invited to explore a range of activities that might well prove life-changing and life-enriching. In this way many people would surely discover talents they didn't know they had, and they would be encouraged to cultivate interests that would otherwise have remained undiscovered throughout their life.

It seems reasonable to assume that for most people, if not all, there are certain activities, and some areas of interest, that have the potential to enthrall them, to trigger major uplifts, and to make them feel good about themselves. But people may well need help to identify such powerful and rewarding activities. An AI system could make the necessary psychographic assessments, identify activities that appear to hold promise, and then encourage the person to explore these. The system would be able to immediately provide appropriate digital materials (educational courses, music, video, games, etc.) as well as signposting the person to relevant local resources (such as gyms, walking routes, choirs, concerts and social groups of many kinds). The system would be able to act as a tutor, or as a well-matched opponent in games and competitions. It could collaborate with the user, for example in solving puzzles, and it would be able to engage in conversations on any topic. With a constant stream of personally tailored resources and activities on offer, people would surely not be bored or feel their life to be empty and unsatisfying. Instead, they might well find life endlessly stimulating, rewarding and meaningful.

Intelligent machines and AI systems could work for the individual as a personal coach, not only providing assessment and guidance, but also motivating the person, monitoring progress, encouraging commitment and rewarding success. Thus the

system might use friendly and positive strategies to encourage the maintenance of healthy behaviours such as those involving eating, drinking, exercising and spending time outdoors.

Social activities are clearly central to people's well-being and there are several ways in which the kind of system described here could enhance people's social life. In fact, for over 30 years self-descriptions have been used as data to match individuals who might enjoy each other's company and perhaps become romantically involved. Online dating is a major business enterprise and around one-third of U.S. marriages and 70% of homosexual relationships now start online (Cacioppo et al. 2013). Doubt has been cast on the effectiveness of particular algorithms used by major dating operations (Finkel et al. 2012), but few would doubt that in principle algorithmic-based matching can be highly effective. Matching people as potential friends, without the romantic element, could be extremely useful in bringing people together. Arranging online meetings or face-to-face meetings with local people might do a great deal to end the scourge of loneliness.

With a comprehensive knowledge of 'What's On' in the local community, gleaned from posted announcements and advertisements, the system would also be in a position to recommend personally tailored forthcoming events and social gatherings. A knowledge of the psychographic profiles of pairs or groups of friends, or of couples, or members of a family, would allow the system to recommend activities, events and entertainment resources of common interest. It is easy to imagine how such a facility might be applied, for example, to help couples find new mutual interests and new activities that they would enjoy doing together. And of course the system itself could function as an important and attractive social resource, acting at various times as a confidante, companion, colleague and counsellor (Frude 1984).

Education—Challenge and Opportunity

In his book *Homo Deus*, Harari (2016) asks what a future school curriculum should look like, and suggests that we have no idea because, until now, a major vector shaping the school curriculum has been the needs of the workforce. Skills of reading, writing and maths are useful in everyday life, but they are also essential for the further learning that may be essential for later employment. Directly or indirectly, a good deal of formal education has been vocationally driven, so a major societal change leading to very few human workers might well prompt a radical rethinking of the curriculum. The skills and knowledge recognized as particularly valuable in a workless society might include those of lifestyle management, social interaction and parenting.

Teaching children in large classroom groups is efficient but not optimally effective. The ideal might be for children to learn together in a communal space but for each of them to receive teaching precisely matched not only to their individual knowledge and skills, but also to their capacity for learning, their interests and their preferred learning style. Technology makes it possible for each child to have their own full-time personal tutor, albeit not one of flesh and blood. But every child would surely

benefit from a kindly, intelligent, softly spoken robo-teacher with endless patience, a fund of engaging stories, anecdotes and metaphors, with the ability to pace lessons precisely in accordance with the child's level of understanding, and using a flexible approach to teaching modelled closely on the styles of the most inspiring human teachers.

Inspiration is important in many areas of human endeavour, but is especially important in the educational context. People who are evidently inspired by what they do, and have remained enthusiastic about their 'calling' over the longer term, often appear to have a firm sense of what their life is about. When such people speak about how they first encountered the issue or activity that was to become the source of their continuing inspiration, it is striking how often chance factors appear to have played a vital role. Thus, many attribute their lightbulb discovery to the fact that they just happened to have an inspiring teacher in a particular subject, or that they just happened to see a particular TV programme at an early age.

Such people are indeed very lucky. Imagine all those who might have been similarly inspired by a particular teacher or a specific TV programme but weren't in the right place at the right time. But the important process of identifying an individual's potential passions and their latent talents doesn't need to be left to chance. It should be possible to systematically explore aspects of a person's individual make-up so that he or she can be guided to resources that will allow them to discover activities likely to have a very special relevance for them. Initially, they would be gently encouraged to consider and explore a range of possibilities and, if the assessment is accurate, people should find the recommended activities particularly engaging and enjoyable. Continued exploration might convince them of the significance of what they had discovered about themselves. This process could, in principle, give everyone, child or adult, the equivalent of access to an inspiring teacher and guide who would help them to realize their potential and be the best they could possibly be. In this ideal, but perfectly realizable, scenario of the future, no potential athlete would remain a passive TV watcher, and no more great (potential) violinists would go through their life never knowing of their remarkable talent and never having handled a fiddle.

The educationalist Robinson (in his 2010 book *'The Element: How Finding Your Passion Changes Everything'*) speaks of children suddenly blossoming in enthusiasm and engagement when they happen to find something that puts them 'in their element'. For example, in the 1969 film *Kes*, directed by Ken Loach, an unhappy and oppressed boy comes into his element when he happens to find, rescue and care for an injured kestrel, and his intense involvement in this whole experience changes his attitude, his behaviour and his life completely. Similarly, in the 2000 film *Billy Elliot*, directed by Stephen Daldry, the eponymous hero appears chronically unenthused by life until he discovers his talent and love for ballet dancing. Both boys may be said to have 'discovered themselves' as a result of the chance events that generated their inspiration and fuelled their passion.

Robinson suggests that children who are bored in class, people who feel disillusioned with the work they are doing, and those who feel generally lost and frustrated in life, come alive when they find their element, recognize their latent talents and discover issues and areas of life that they feel passionate about. He suggests that

everyone has the potential to 'come alive' and to be energized by a range of activities that will enable them to fulfil their potential. What is needed to realize this extremely positive vision is a wholesale way of helping people to identify their potential enthusiasms and undiscovered talents. Robinson suggests that this can be achieved by changing educational practices, allowing children to find their strengths rather than forcing every child to follow a standard curriculum, which inevitably leads to many children having to do things that they are not interested in and are not good at.

The psychotechnological process sketched above offers another way in which adults and children might be guided towards activities that would substantially improve their quality of life, promoting a high level of subjective well-being and greatly increasing their positive physical and mental health. According to this vision, the absence of work could be a major blessing, allowing people to do what they would prefer to do, and what they can excel at, rather than doing what they are told to do and paid to do. This is why the solution suggested here can be regarded as better than merely replacing the psychological deficits and distress commonly associated with not being in work.

Conclusion

Employment satisfies important psychosocial needs for many people and in many ways it is central to individual identity, social roles and social status. When people are not in work, either because they are involuntarily unemployed or because they have retired, they often suffer substantially as a result. On the other hand, many people experience ill-effects through the work they do. The principal negative effect of working is stress, and work stress often leads to severe psychological and physical effects (Warr and Nielsen 2018).

However, the work situation appears to be about to change markedly. While there is little consensus about the pace or extent of the changes, many believe that within a few decades AI-based systems will outperform humans on almost every type of work-related task. When this happens, a large number of people will no longer be employed and will, therefore, have lots of time in their hands. In the words of one prominent commentator (Harari 2016) humans will be out of the job market and will become 'the useless class'.

Arguably, such a potential relegation makes AI a major threat to human dignity and the self-esteem of the species. It is sometimes said that Copernicus cut humankind down in size by informing us that the Earth is not the centre of the universe, that Darwin brought us further down by pointing out that we are mammals much like other animals, and that Freud downgraded us further when he suggested that our unconscious controls much of what we feel, think and do. But, despite this serial downgrading, we still hold on to the belief in our superiority in terms of our creativity, our ingenuity, our complex languages and our intelligence. However, each one of these claims to superiority may now be under threat from AI, and some would regard this as likely to inflict a final blow to human self-esteem.

On the one hand, robots and AI will make people redundant but, on the other hand, such technological developments could help people to replace paid employment with activities that will powerfully enrich their lives, enhancing their well-being and their health. Today, unemployment often deprives people of 'the dignity of work', but future artificial systems may help people to discover enhanced dignity in aspects of their life that have nothing to do with paid employment.

When we don't have to work for a living we will have a lot of time to invest in our own well-being and the well-being of others. And maybe we will also choose to spend some of our time thinking about what we want our life to be about and then acting on our conclusions. When we have identified our personal values we will be in a good position to work out how we can best live our life in line with those values. And we will have time to think about basic existential questions if that is what we choose to do.

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Chapter 8
Technological Unemployment as a Test of the Added Value of Being Human

Steve Fuller

Classical Political Economy's Challenge to the Value of Humanity

A genealogy of technological unemployment would reach back to classical political economy, especially the big conceptual shift that the field underwent from Adam Smith to David Ricardo at the turn of the nineteenth century, which left an indelible impression on the subsequent history of capitalism, not least on its keenest critics such as Karl Marx. But let us begin with what they could all agree on. Smith, Ricardo and Marx understood capitalism as redressing the damage done by the inhibitory effects of feudalism and mercantilism on human productivity. They believed that these earlier economic systems prevented people from being all they could be, which in turn stifled the progress of humanity as a whole. Feudalism inhibited productivity through divinely sanctioned hereditary laws that circumscribed people's sphere of action at birth, regardless of their actual capacities. Mercantilism, at least in Smith and Ricardo's eyes, seemed to offer a secular version of the same setup, whereby a god-like monarch granted a merchant exclusive license to a market in which others might have provided superior goods, were they given a chance.

This helps to explain the contempt in which the classical political economists, including Marx, held rent-based forms of wealth creation, ranging from landlords whose main source of income is charging tolls for access to their property to monarchs whose coffers were supplied by various fees they could extract for privileged market access. In effect, the great economic sin committed by the 'rent-seeker' is to produce wealth simply by impeding the capacity of others to produce wealth. In recent work, I have argued that academic expertise is ripe for a similar critique, insofar as 'credentials' have become in Latour's (1987) resonant phrase, 'obligatory passage points' which serve to channel personal advancement in certain directions

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(and 'networks') as well block the advancement of those who for whatever reason can't overcome those artificially imposed constraints (Fuller 2016, 2018b).

Ricardo is such a pivotal figure because he adds technology into the mix in a way that Smith did not—and which bears on the topic of technological unemployment. Ricardo effectively raised the political economy to a 'second order' project, one concerned with the production of wealth per se—regardless of who or what did it—rather than the production of wealth in a 'nation', understood as a group of people in a common space governed under the same customs and laws. It is not trivial that Adam Smith's main work is called *The Wealth of Nations*, and Ricardo's is called *Principles of Political Economy*. Ricardo regarded the scarcity of nature itself—including the physical and mental limitations of actual human beings—as an ever-present attractor of rents. In the normal course of things, a large competitive labour market deterred workers from restricting access to their labour in a manner comparable to the rents that landlords charged for access to their property. (He had in mind artificially high wages.) But Ricardo also believed that in the long run human ingenuity in the form of technological innovation might put an end to all such rent-seeking temptations. Noble (1997) got the correct measure of this view, as suggesting 'human ingenuity' amounted to unleashing our divine natures from its fallen material condition, a kind of secularized Christian Gnosticism, which in the nineteenth century served to reverse the moral valence of the word 'innovation' from monstrous to propitious (Godin 2015). The latter-day offspring of this Ricardian line of thought is 'transhumanism', aspects of which we shall touch on in what follows (Fuller and Lipinska 2014).

From this brief description, it is easy to see why Ricardo would not have been a friend to labour unions—but more to the point, why Marx would base his critique of political economy so specifically on Ricardo's work. On its face, Ricardo would seem to have de-humanized political economy in a way that might have appalled Smith. Ricardo shifted the burden of proof away from presuming a 'natural' or 'just' wage for human labour as such (which free markets would spontaneously reveal) and toward forcing particular humans to justify their wages in a market where others might gain a competitive advantage by offering to do the same job for less in return. Moreover, given the role that technological innovation had already played in ameliorating the human condition, starting with the redeployment of animals to assisting in hunting and gathering at the dawn of civilization, Ricardo had no problem seeing non-humans as part of the potential competition. The logic is simple: If something is truly of value, then it is always open how it can be best supplied, given the level of demand and exactly what it is about the thing that determines its demand. Put more practically, anything that you might want serves some function for you. In principle, that function could be realized in many different ways by many different means. Economics is about determining the price you're willing to pay for these realizations, which effectively makes it the science of substitution—and that may involve having humans substituted by machines.

The prospect of technological unemployment has been long regarded as in equal measures threat and opportunity, usually in that order as part of a common process. The short-term threat is that the bulk of manual labour and other 'low skill'

jobs would be replaced by machinery, in many cases automated. However, the long-term opportunity is that people would acquire new, cognitively more advanced skills for tasks that machines could not themselves perform but would enable humans to perform more quickly and accurately. While Marx himself imagined this two-stage process to be sufficiently disruptive as to lead to the replacement of capitalism by socialism, other socialists—starting with Saint-Simon and developed by the British Fabians—envisaged a smoother transition, one facilitated by long-term central planning, which included a regular skills inventory of the population and a policy of educating everyone up to the level of their cognitive potential.

By the Cold War, this second approach had become dogma for both self-described 'capitalist' and 'socialist' nations as the modern face of democracy. The term used both then and now for it is 'technocracy'. The US sociologist Bell (1973) canonized it as the cornerstone of an emerging 'post-industrial' society, in which skills that were previously restricted to an intellectual elite would in the future enhance society at large. In this respect, 'post-industrial' meant 'meta-industrial', in that the cognitive basis for class distinctions would be minimized if not dissolved once everyone is capable of understanding—and affecting—the rules by which the production and distribution of goods and services in society are organized. (This is comparable to my own use of 'post-truth' to mean 'meta-truth': Fuller 2018b.)

A personal reminder of Bell's vision is that when I started at Columbia University in 1976, the ability to programme in a computer language (Basic, Fortran or Cobol) was just as much part of the 'general education' requirement as mastery in writing a foreign natural language. The ongoing work of the US technology critic Rushkoff (2010) remains very much in the spirit of this original vision, which interestingly is now pitched as politically radical: 'Program or be programmed!' To be sure, there is still much to this general vision, but its success would amount to recovering a 'lost future', one that came to be closed off with the advent of 'user-friendly' technological interfaces, the import of which Bell had not anticipated. This was already becoming a focus of critical concern even before Steve Jobs transacted a trade-off between 'smart environment' and 'dumb human' on behalf of his Apple-dependent 'community' (e.g. Fuller 1986). Notwithstanding the unheeded harbingers in this case, the general point remains that projects to recover 'paths not taken' have in the past successfully inspired visions of an improved future (Fuller 2015a: Chap. 6).

The myopia of Bell's original post-industrial vision went beyond the simple failure to anticipate the disempowering character of user-friendly interfaces. Bell equally underestimated the speed with which artificial intelligence would match and even overtake humans in cognitively advanced skills—at the same time as large segments of the population were being encouraged to enter into jobs requiring just such skills. Moore's law, which predicts the exponential rise in computational power, gets at this point, albeit somewhat crudely. Moreover, this myopia was not limited to Bell. Even as astute a general observer of technological change as Marshall McLuhan fixated on the miniaturisation of electronic circuitry but not the increase in processing capability that it would bring. He got right the consumer angle but not the cognitive angle on artificial intelligence.

To be sure, concerns were already being raised about the societal import of artificial intelligence research in the 1970s, but back then much greater emphasis was placed on the prospects of a cybernetic dystopia, in which the human being—however well-skilled—would be increasingly rendered a component of a 'dehumanized' world. In this context, exemplified in Stanley Kubrick's *2001: A Space Odyssey*, artificial intelligence ('Hal') is presented as radically alien to the human, not simply beating the human at its own game. Jacques Ellul (1964) perhaps provided the most influential philosophical presentation of this cybernetic dystopia at the time. In retrospect, his critique is best seen as an updated expression of the demonization of the 'artificial' in favour of the 'natural' that characterized the original Luddite response to the Industrial Revolution and persisted in the early Marx's preoccupations with the alienation of human labour as it was forced to adjust to the rhythms of factory work. On this view, a computer—however sophisticated—is in the end just a big machine.

To be sure, a contrasting albeit somewhat more subterranean vision of artificial intelligence was available at the time. It was as part of a projected transhumanist future, whereby intelligence as such gradually migrates from biology to technology. This prospect had been always close to the surface of Norbert Wiener's conception of cybernetics, not least in his classic popularization (Wiener 1950). In the 1960s this vision acquired added theological ballast with Teilhard de Chardin's (1961) conception of the 'noösphere', which arguably provided a metaphysical prototype for global electronic communications. The idea was what we now call the 'internet' would be an extension of human cerebral powers comparable to the extensions provided by the earlier mass media revolutions, starting with the printing press (Fuller 2011: Chap. 4).

Here too Marshall McLuhan did not see an important aspect of what Teilhard and others were adumbrating at the time, namely, the *distributed* character of electronic communications. This has served to level the distinction between producers and consumers of information, resulting in our current 'post-truth condition' (Fuller 2018a, b). This is the opposite of asymmetrical broadcasting model for the 'global village', which McLuhan (1964) believed that would follow along the lines of television as a 'cool medium' that absorbs the mental space of its viewers, turning them into 'couch potatoes' in the thrall of an oligopoly of broadcasters. The dystopic character of this vision was brilliantly captured in the early (1983) David Cronenberg film *Videodrome*, which features the character Brian O'Blivion, a media guru modelled on McLuhan. In the course of the film, one discovers that O'Blivion is long dead but his influence is exerted through strategically inserted videotape cassettes of his living appearances on broadcast television. Nowadays, in our more distributed media culture, O'Blivion's videos would circulate as 'memes' edited to users' needs.

If we grant that Wiener and Teilhard displayed greater foresight than either Ellul or McLuhan, the problem awaiting us in the twenty-first century is not that our humanity will be crushed under the weight of automated technology but that our intuitions about what it means to be 'human' will blur as we increasingly rely on prosthetics, ranging from artificial limbs to embedded silicon chips and, if Silicon Valley billionaire Elon Musk gets his way, 'neural lace' that will enable our brains

to interface directly with computer-based digital information, potentially merging us with Teilhard's noösphere (Solon 2017). Indeed, neuroscientist David Eagleman has begun to develop 'wearable sensory technologies' that interface with the brain in ways that augment our capacity to experience reality via new artificial senses (Mason 2015). In short, I mean the world of the *cyborg*—or simply the 'Borg', as *Star Trek* would have it.

Lawyers are already discussing whether cyborgs—artificially enhanced beings of biologically human origins—require the same or different rights as 'normal' humans, given their potentially different needs and capacities (Wittes and Chong 2014). What makes this matter especially tricky is that today most of the widely used 'artificial enhancements', ranging from pills to chips, are designed to correct disabilities. (Consider the physicist Steven Hawking who at the time of his recent death from motor-neuronal degradation was 75% silicon in terms of body mass.) In other words, 'enhancement' is prescribed to 'restore' normal functionality. However, even in these cases, the disabled person is rarely returned to how they were before they became disabled—or how they would have been had they not been born with the disability. Rather the person is put in a state of 'functional equivalence' to normalcy with regard to targeted ability. However, this typically requires that the person readjust their lives in ways that possibly include acquiring new abilities that are by-products of the 'enhancements'.

A very striking case in point is Neil Harbisson, whose severe congenital colour-blindness was 'remedied' by implanting an antenna in his skull that allows him to discriminate light waves in terms of sound, a physiological expression of synaesthesia that has enabled him to earn a living as an audio–visual performance artist. On the basis of this experience, Harbisson spearheaded the 'Cyborg Foundation', which campaigns for cyborg rights. But the foundation's ambitions go beyond securing the resources needed for cyborgs to function normally among humans. It also aims to promote the cyborganization of humanity, capitalizing on the point noted above by Wittes and Chong (2014), that non-disabled people are increasingly comfortable with exchanging features of their bodies of birth for artificial extensions that may provide new powers. Moreover, the result may end up conferring some sort of net personal and possibly societal advantage, as in the case of Harbisson himself, whose identity morphed from 'radically disabled' to 'avant garde' (Jeffries 2014). In this regard, one might think of 'elective cyborganisation' as a form of human capital development, a more physiologically invasive form of 'skill upgrading' that results in an increased capacity for innovation and productivity more generally.

As this trajectory from cybernetics to cyborgs was becoming more prominent in the 1980s (e.g. Haraway 1991), there were also signs that artificial intelligence would challenge humanity's species distinctiveness. Two developments stood out in that decade. The first was the revival of parallel distributed processing computation, which aimed to simulate the brain's carbon-based neural wiring in silicon. This had been one of the original artificial intelligence projects in the 1950s, championed by the likes of Ross Ashby, Walter Pitts and Warren McCulloch (Pickering 2010; Malapi-Nelson 2017). However, it was quickly abandoned due to a sense of the brain's overwhelming complexity, which was widely attributed to the higgledy-

piggledy nature of biological evolution. Thus, artificial intelligence research was initially focused on creating machines capable of performing the brain's functions without trying to simulate the workings of its wetware. But the prospect of greater machine-based computational power has revived that original ambition, the latest expression of which is the US-based BRAIN Initiative and its EU-based counterpart, the Human Brain Project. However, there remains an open question—not explored here—of whether supercomputers, however accurate, could ever match the energy efficiency of the human brain, notwithstanding all of the brain's wetware-based liabilities (Fuller 2018a).

The second development challenging our species distinctiveness was the advent of computerized 'expert systems' capable of delivering complex judgements on matters involving the manipulation of many statistical variables with greater reliability than, say, juries or clinical practitioners. To be sure, the programmes operating such systems were largely derived from in-depth interviews with human experts, often taking the form of decision trees covering various hypothetical situations. But of course, in real-world settings, other factors would always be at play in human judgement—including various ingrained biases and processing limitations—that have been shown to confound the desired outcome. In terms of human psychology, this led to a move away from any generalized notion of 'intelligence' that might be unique to humans to a more 'modular' version of multiple intelligences, at least some which might be offloaded to machines specifically designed to surpass human performance over a cognitively closed range of tasks. By the early 1990s, I anticipated the de-skilling of human expertise that was likely to result from such advances (e.g. Fuller 1994, later developed in Fuller 2002).

Are Humans an Ontologically Endangered Species? Diagnosing the Dreyfusards

Notwithstanding the role that technological innovation has played over the past several 1000 years in re-drawing the boundaries of what it means to be human, there remains considerable resistance to the very idea that machines might acquire traditionally human properties. Over the course of my career, perhaps the most articulate philosophical advocate for this rear-guard position has been the US phenomenologist Dreyfus (1992). It is 'rear-guard' because Dreyfus and his followers—an impressive recent example of which is Frischmann and Selinger (2018)—trade on the dubious notion that our intuitions about what is intrinsic to the human condition are secure—and have been for a relatively long time. But practically speaking, for these 'Dreyfusards', the 'we' consists of those who have taken at least one philosophy course and take most judgements in their everyday life without consulting a computational device. Such people would presumably 'understand' what is at stake in letting technology what humans have previously done or measuring human perfor-

mance against technologically based criteria. But are the Dreyfusards representative of the normal human population? Probably not—and in any case, their numbers are diminishing.

More generally, I have never taken Dreyfus-like arguments seriously because they attempt to settle a priori what has always been settled a posteriori—namely, the dividing line between the human and the non-human. After all, on the basis of embodiment, women and Blacks have been excluded from 'humanity' as recently as two centuries ago (Bourke 2011). Moreover, in a recent ironic twist, Dreyfus' argument has been, so to speak, 'hoist by its own petard' by critical race and gender scholars, who argue that the embodiment differences between, say, men and women or Whites and Blacks renders illusory any sense of 'universal humanity' at the phenomenological level. Indeed, I believe that the unapologetically constructivist cast of the Turing Test—originally gender-blind but equally substrate-blind—remains the benchmark of demarcating the human and non-human (Genova 1994). In other words, if a candidate entity passes as 'human' on the basis of its sustained performance, then it counts as a human, regardless of its class, race, gender or substrate. As it happens, as more candidate entities have been admitted into the ranks of the human, the door has been opened for still other *prima facie* outliers to try for admission. I tend to think of this process as a kind of 'ontological immigration policy', whereby aliens apply for citizenship in humanity (Fuller 2015b).

Now there are two possible 'humanistic' responses to this situation: one *anthropocentric* and the other *anthropomorphic*. To be sure, these two words are often regarded as synonyms, but in fact their meanings pull in opposite directions. In economic terms, anthropocentrism takes a protectionist stance towards the human, whereas anthropomorphism takes a liberal stance. The former wants to restrict the application of 'human', whereas the latter wants to open it. The sort of Turing-focused historical dynamic described in the previous paragraph is anthropomorphic because it is sufficiently blind to a candidate being's origins to deny any advantage to 'hereditary humans' (i.e. *homo sapiens*) in determining who will count as human. In contrast, an anthropocentric historical dynamic would keep raising the bar of entry into human citizenship as a means of reasserting the advantage of hereditary humans. In this latter context, I have spoken of humans as harbouring a 'fugitive essence' that is designed to escape any attempt to algorithmic containment—and hence mechanical reproduction (Fuller 2002). I shall return to this 'apophatic' sense of human identity in the final section of this piece.

At a general social psychological level, Dreyfusards fail to appreciate the role of *adaptive preferences* in redefining the human/non-human divide. Adaptive preferences form when people bend their desires towards their expectations. Depending on one's point of view, this tendency may be regarded as evidence of 'rationality' or 'rationalisation'. In either case, adaptive preferences constitute a strategy to restore cognitive coherence in the face of some major disruptive experience (Fuller 2018b: Chap 7). The strategy takes complementary forms, both of which are familiar: 'sour grapes' (i.e. the downgrading of end states previously held to be good that one now

believes to be unachievable) and 'sweet lemons' (i.e. the upgrading of end states previously held to bad that one now believes to be achievable). Taken together, they amount to what Nietzsche would recognize as a 'transvaluation': In other words, the things called 'liabilities' and 'virtues' exchange identities (Joas 2000: Chap. 2).

The idea of transvaluation derives from *theodicy*, the branch of theology—quite popular in the early modern era—dedicated to showing how notwithstanding the world's misery, it is still the best of all possible worlds. What is required to appreciate God's sense of justice (the literal meaning of 'theodicy') is a general awareness that we might have got 'good' and 'bad' backwards, just as we often confuse 'true' and 'false'. In the case of higher education, one provocative example concerns the extent to which classroom-based teaching can be replaced by online self-learning. What defenders of the classroom present as the lecture's capacity to challenge students to transcend their normal ways of approaching the world, defenders of the online experience recast as a waste of time in meaningless suffering, especially given that most students are not interested in becoming lecturers. Conversely, what defenders of the classroom regard as the regime of behaviour modification imposed by the online experience come to be seen as customized learning designed to fit specific students' needs.

Perhaps the main general example of transvaluation in terms of the technological transformation of work is that the idiosyncrasies of craftsmanship turn into evidence for a lack of standardized performance, while mechanical routine becomes markers of reliable efficiency. This shift in orientation is not reducible to a new technology coming to be imposed on people against their will. Rather, what happens is subtler, as users come to trade off their old values for the values associated with the new technology. Indeed, they usually realize to some extent that, say, craftsmanship is losing its standing as a guiding value, but it's a cost they're willing to pay in return for the benefits of standardization. What often happens during such episodes of transvaluation is that the old value continues to be pursued in 'boutique' settings that in some respects preserve the old context associated the old way of doing things. Scarcity thus replaces the utility as the locus of value. This, in turn, may lead to a further transvaluation, if this newfound scarcity plays into some elite power dynamics in the larger society. We might see the ebb and flow of the fortunes of 'liberal arts' education over the course of history in this light: Are they truly useless or does their 'uselessness' constitute a higher form of value—'symbolic value', if you will—that feeds more directly into society's second-order governing processes?

Here is a precedent to ponder. The ancient Greeks developed the Olympics by abstracting particular human skills from the real-world contexts in which they performed socially useful work in, say, hunting or combat. These skills had always been presumed to require regular exercise even when not put in use. But taken independently of any preparation for work, this exercise could be treated as a dynamic form of human artistry, as in the case of dance—something in which one could excel for its own sake, even when a virtuoso performance of mobility did not result in the arrival at some physical destination. This is how competitive sports are now widely seen. Moreover, in many if not most cases, the real-world contexts in which these skills were originally honed no longer require human effort. (Military drones are

currently crossing one of those frontiers.) Nevertheless, the sports remain highly valued—even though the source of their value has radically shifted from the utilitarian to the intrinsic or symbolic. It is entirely possible that artificial intelligence will result in a similar 'transvaluation' of human cognitive skills, as in Hermann Hesse's *Glass Bead Game*, itself an updating of Plato's *Republic* and a harbinger of a rich vein of science fiction, which Neal Stephenson has mined especially well in such works as *Anathem* and *The Rise and Fall of D.O.D.O*.

Budgeting for the Human in a Substrate-Neutral World: Will the Brain Save Us?

In 2015, I participated in a panel at the Silicon Valley-sponsored 'Brain Bar Budapest'. The panel, chaired by the UK economics journalist Stefan Stern, was on the fundamental transformations of the human condition that were likely to result from a range of emerging information-based technologies. Unlike the other panelists, who stressed how such technologies would enhance and change our lives in interesting ways, I was more concerned with the 'value-added' of being 'human' in a world which has been long tending towards replacing human labour with 'smart technologies'.

The 'human' can no longer be taken for granted as something that adds value to being-in-the-world. The value needs to be earned, it can't be just inherited. The value that we place on today's humans is largely based on their having come from human ancestors and building on their work—regardless of either the inherent fairness of such a judgement to other forms of life or even its appropriateness as a standard for judging today's humans (i.e. today's humans may be slackers compared to their ancestors). Perhaps unsurprisingly, then, animal rights activists claim that 'value-added' claims to brand 'humanity' amount to an unjustified and self-serving privileging of the human life-form, whereas artificial intelligence enthusiasts argue that computers will soon exceed humans at the ('rational') tasks that we have historically invoked to create distance from animals. I shall be more concerned with the latter threat, as it comes from a more recognizable form of 'economistic' logic.

Economics makes an interesting but subtle distinction between 'price' and 'cost'. Price is what you pay upfront through mutual agreement to the person selling you something. In contrast, cost consists of the resources that you forfeit by virtue of possessing the thing. Of course, the cost of something includes its price, but typically much more—and much of it experienced only once you've come into possession. Thus, we say 'hidden cost' but not 'hidden price'. The difference between price and cost is perhaps most vivid when considering large life-defining purchases, such as a house or a car. In these cases, any hidden costs are presumably offset by 'benefits', the things that you originally wanted—or at least approve after the fact—that follow from possession.

Now, think about the difference between saying, 'Humanity comes at a price' and 'Humanity comes at a cost'. The first phrase suggests what you need to pay your master to acquire freedom, while the second suggests what you need to suffer as you exercise your freedom. The first position has you standing outside the category of 'human' but wishing to get in—say, as a prospective resident of a gated community. The second position already identifies you as 'human' but perhaps without having fully realized what you had bargained for. The philosophical movement of Existentialism was launched in the mid-twentieth century by playing with the irony implied in the idea of 'human emancipation'—the ease with which the Hell we wish to leave (and hence pay the price) morphs into the Hell we agree to enter (and hence suffer the cost). Thus, our humanity reduces to the leap out of the frying pan of slavery and into the fire of freedom.

In the twenty-first century, the difference between the price and cost of humanity is being reinvented in a new key, mainly in response to developments—real and anticipated—in artificial intelligence. Today 'humanity' is increasingly a boutique item, a 'value-added' to products and services which would be otherwise rendered, if not by actual machines then by humans trying to match machine-based performance standards. Here optimists see 'efficiency gains' and pessimists 'alienated labour'. In either case, 'humanity comes at a price' refers to the relative scarcity of what in the past would have been called 'craftsmanship'. As for 'humanity comes at a cost', this alludes to the difficulty of continuing to maintain the relevant markers of the 'human', given both changes to humans themselves and improvements in the mechanical reproduction of those changes.

Two prospects are in the offing for the value added of being human: either (1) to be human is to be the original with which no copy can ever be confused, or (2) to be human is to be the fugitive who is always already planning its escape as other beings catch up. In a religious vein, we might speak of these two prospects as constituting an 'apophatic anthropology', that is, a sense of the 'human' the biggest threat to which is that its nature might be defined ('apophatic' means 'unspeakable'). At that point a clear sense of what lies beyond the control of the human—and may serve to control the human—comes into view. This sense of the need to escape positive definition was originally invoked in medieval Abrahamic theology to characterize the unbounded nature of divine being: God as the namer who cannot be named. On this view, any attempt to characterize the deity in its uniqueness—that is, by addressing it via a proper name—amounted to blasphemy.

But in a more secular vein, we can envisage on the horizon two legal regimes, which would allow for the routine demonstration of the 'value added' of being human, and hence render the 'apophatic' turn unnecessary. In the case of (1) in the previous paragraph, the definition of 'human' might come to be reduced to intellectual property-style priority disputes, whereby value accrues simply by virtue of showing that one is the originator of something of already proven value. For example, the US economist Hanson (2016) has envisaged a future in which computer-powered emulations of human brains end up becoming the primary wealth generators, in which case the humans effectively receive a perpetual pension for their original contribution. In the case of (2), the 'human' might come to define a competitive field

in which people routinely try to do something that exceeds the performance standards of non-human entities, notably computational machines—and added value attaches to that achievement. This would render the 'human' a quality not unlike sporting excellence, even a synonym for 'Olympic standard'. The crucial difference is that the expectation here is for the machines to raise the bar as they come to meet the new human standard.

Either—or some combination—of these two legal regimes might work to the satisfaction of those fated to live under them, at least insofar as 'human' continues to possess a positive meaning worth striving for. However, what is long gone is any idea that there is an *intrinsic* 'value-added' to being human. Whatever added value there is will have become a 'moveable feast' that always needs to be fought for tooth and nail, as machines also improve their capacity for intelligence. In this scenario, it would still be possible to extinguish the human. However, this need not happen by machines literally exterminating us as surplus to the requirements for a rational world-order—the scenario envisaged in Bostrom's (2014) 'superintelligent' takeover of the planet. Rather, it would come more in the manner that Hanson imagines, whereby humans become increasingly marginalized to the point that, say, supercomputers can upload their 'minds' to each other in ways that make the need for an original human brain redundant. In that case, so Hanson thinks, humans would be retired to sanctuaries like today's protected animal species, no longer in the evolutionary vanguard. But arguably, at that point, humans will have been stripped of their self-transcendent sense of 'humanity' and brought back down to their biological natures as *homo sapiens*.

As I earlier observed, the one thing that could decisively overturn this scenario in favour of humans is the efficiency of our brains. Computers look 'efficient' just as long as the measures used are speed and accuracy of response to a question in a specific domain in which the computer has been already programmed. However, if actual energy consumption is added to the equation, brains look much more efficient, even though their responses are slower and often less accurate. Moreover, this point needs to be understood in the context of brains normally being engaged in whole host of 'parallel distributed' processes, not only to make sense of the external environment but also to keep the body to which it is attached functional. In that very basic sense of overall *modus operandi*, brains are not constituted like serial computers, which process input one at a time. Indeed, the true measure of the brain's efficiency is that it took a supercomputer programmed with a neural network forty minutes to simulate one second of processing in a brain two percent of the size of a normal human brain (Fuller 2018a).

This suggests that while it may make sense to develop supercomputers capable of surpassing human performance in a range of specific tasks, it would be an ecological disaster to try to create an artificial intelligence capable of approximating the performance of the entire human brain. The prospect brings to mind the denouement of the 2014 film *Transcendence*, in which the first human to have his brain uploaded into a supercomputer manages to short-circuit the entire planet. From this standpoint, Elon Musk's recent 'neural lace' initiative to promote the development of brain–computer interfaces, notwithstanding its cyborg aspirations, may be turn out to be the most

energy efficient strategy for promoting human-friendly 'superintelligence'. Is there anything practical at stake in this difference? While no one denies that all members of humanity up to this point have been born as individual members of *Homo sapiens*, that may turn out to be a contingent feature of our humanity, if, say, in some sense our humanity is more closely tied to our creative efficiency, a capacity that may be brought out more fully through the enhancement and even extension of our being through technology (e.g. Clark 2003).

If all of this still seems unduly metaphysical, here is a concrete case where the difference may matter. In 2003, the United Nations convened a World Summit on the Information Society in which internet access was proposed as a basic human right. Since that time, the initiative has gained political momentum and may be more widely enforced across the world than what would normally be regarded as more fundamental human rights—bodily integrity, food, shelter, material security, healthcare, education—as outlined, say, in the original 1948 UN Universal Declaration of Human Rights. This would be quite a surprise to a 'humanist' who subscribes to the sort of hierarchy of needs that the psychologist Maslow (1954) advanced for a flourishing human existence. Indeed, given the surprisingly large amount of mobile phone use across even the most impoverished areas of the world, it would seem that people are, so to speak, 'putting the cart before the horse'. In Maslovian terms, they are favouring a need much higher up the hierarchy over the lower needs that—at least on his theory—are necessary to support it.

To be sure, there is evidence that internet access via mobile phones has enabled people in the developing world to coordinate their activities so as to provide for certain basic needs—but not in any *institutionalized* way, which was the spirit of Maslow's 'hierarchy of needs' metaphor. Instead, we have a case of the strength of a chain determined by its weakest link, which the sociologist Granovetter (1973) converted into the virtue known as 'the strength of weak ties', whereby the 'weak link' is positively interpreted as a 'broker'. Nevertheless, the bottom line is clear, albeit disturbing from a Maslovian standpoint: People seem quite happy to advance to a 'higher' state of humanity even while the conditions associated with the lower states remain precarious—in some respects perhaps even more so, given an ever greater dependence on internet access to address basic life problems.

The most natural interpretation of this situation is through a political lens, namely, demonstrating that people instinctively favour liberty over security. However, for purposes of my argument what is more telling is the apparent willingness of people to identify more with their technology than their biology. The advent of personal computers and smartphones may have initiated a process whereby intuitions surrounding the locus of the human essence is being shifted. As was observed earlier, all of this is happening as Bostrom, Hanson and others are pointing to the obsolescence of the human condition qua *homo sapiens* via some version of artificial intelligence. My own conclusion is that we are retracing the steps that humanity originally took when it 'overcame' God in the nineteenth century, a path that was quite close to the one that Feuerbach (1986) had called for. God never returned to exert control over humanity. But neither did God disappear entirely. On the contrary through the advancement of

science and technology, the biological human has come to replace the transcendental deity. The next step may be for us once again to merge identity, but this time with the technology that has enabled us to get as far as we already have.

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Part II
What Can Places of Learning Really Do About the Future of Work?

Chapter 9
Acceleration, Automation and Pedagogy: How the Prospect of Technological Unemployment Creates New Conditions for Educational Thought

Sam Sellar

Introduction

Recent predictions that automation will produce massive unemployment in the next few decades have generated various responses to the question of whether technological change will be different this time. While some prophesy alarming risks (e.g. Frey and Osborne 2017) and unimaginable change (e.g. Harari 2015), others see a bubble of *fin de siècle* hyperbole (e.g. Wajcman 2017) or yet another example of automation anxiety that should not distract us from prudent investment in human capital and solving the problem of redistribution (e.g. Autor 2015). This chapter will not attempt to arbitrate between these positions, but will instead suggest an alternative approach: assuming the worst as a strategy for pushing the limits of educational thought. We will need to rethink common assumptions about education if the more dramatic predictions about technological change and resultant unemployment prove correct, and we need not wait for this to occur in order to depart upon this line of inquiry. Specifically, the chapter asks how the acceleration of economic growth and technological development may challenge some basic presuppositions of modern educational thought.

Pedagogy presupposes a desire to pass on what is deemed 'good' about one's life to the next generation, thus affirming the future and the possibility of making it 'better' (Mollenhauer 2013). All educational thought embraces a more or less explicit doctrine of salvation, variously conceived in terms of a path towards emancipation, social mobility, a critical and open-minded citizenry, or appropriately skilled human capital to increase economic competitiveness. As Peters et al. (2019: 243) argue, '[o]ne persistent myth, which constantly hovers between extrapolation and imagination, is the idea that more education will somehow make the world a better place'. More provocatively, perhaps, all modern pedagogy can be considered a type of crit-

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ical theory, because it involves describing the world in order that a particular group of people can make it better (Horkheimer 1982). But what becomes of pedagogy if we cannot adequately explain a rapidly changing world and improve it for the next generation?

Predictions that automation will affect large numbers of jobs are based on assumptions that the pace of technological change is increasing exponentially (Brynjolfsson and McAfee 2014). Education policy and practice is confronted with two challenges in this context: (1) a compression of time that leaves social research chasing technological change like Achilles pursuing the tortoise; and (2) the possibility of rare, unexpected yet highly consequential 'black swan' events in which qualitative change occurs that cannot be forecast from past or present experience (Taleb 2007). Put simply, massive automation and technological unemployment will likely make things worse, but in unfathomable ways. Amidst the current proliferation of calls for policies and practices that respond to the challenge of preparing people for automation, the chapter will seek to delineate another problematic: if technological unemployment is not a problem that can be solved by education, then what role can or should formal education play in preparing society for this future?

The theoretical framework for the chapter is drawn from the disparate body of 'accelerationist' texts, including philosophical writings, theory-fictions, blog posts and manifestos. Noys (2010) introduced the term accelerationism to describe a tendency in post-1968 French philosophy that was evident in Deleuze and Guattari's (1983) *Anti-Oedipus*, Lyotard's (1993) *Libidinal Economy* and Baudrillard's (1993) *Symbolic Exchange and Death*. These texts, argued Noys, share a desire to turn capital against itself and thus constitute 'an exotic variant of *la politique du pire*: if capitalism generates its own forces of dissolution then the necessity is to radicalise capitalism itself: the worse the better' (Noys 2010: 5). This period in French theory was a crucial reference point in the writings, events and artefacts produced by the Cybernetic Culture Research Unit (CCRU) at Warwick University in the 1990s, which often revelled in dystopian visions of cyberpunk futures. More recently, writers and artists associated with the CCRU have inspired a new generation of accelerationist thought (e.g. Laboria Cuboniks 2015; Mackay and Avanessian 2014; Garton 2017). Accelerationism can appear to endorse a politics of the worst from the perspective of critical theory, because many variants reject the notion that adequate knowledge will enable people to make things better, but this is not the same as wanting things to get worse. Underpinning the argument developed in this chapter is the hypothesis that there are other possibilities for educational thought outside the Manichaean drama of existence.

Following a brief introduction to accelerationism, the chapter will survey: (1) labour economics literature that models the risks of technological unemployment; (2) sociological literature that predicts diminishing returns on investments in education; and (3) efforts to derive educational theory and practice from predictions about the future of work (e.g. twenty-first-century skills frameworks). The chapter will then argue that *if* the most dramatic predictions prove correct *then* we can let go of a basic presupposition of pedagogy: the aim to improve the future based on past experience.

Accelerationism

Accelerationism is distinguished by the view that economics and technology are locked into a positive feedback loop that compresses the time of production. It offers an alternative to (a) philosophies of technology that emphasise the need to ward off existential risks to human societies and (b) educational theories that lament the incursions of market capitalism and technology into human cultural reproduction. Accelerationism holds that changes driven by technoscientific developments cannot be reversed and argues for a politics that embraces these developments or, more interestingly, rejects the notion that these developments can be controlled. It is from the latter perspective that technological unemployment no longer appears as a problem to be solved.

Accelerationism has been a largely subterranean development in social and political theory that has occurred outside the mainstream social sciences and humanities, in articles and books from niche publishers and online spaces such as blogs and Twitter. There is a good reason to doubt whether the term even describes a coherent school of thought, rather than diverse philosophical and aesthetic expressions of the disorienting sensation that modernity is out of control (Garton 2017). Defined in these terms, accelerationism predates its more explicit theoretical development from the 1970s onwards. Accelerationist fragments can be found in the writings of Nietzsche and Marx, and is evident in the work of the Russian Cosmists and Italian Futurists. Accelerationism thus has significant antecedents in modern thought, even if, as an area of contemporary theory, its impact has been marginal so far.

Intense expressions of accelerationist thought have occurred at conjunctural moments. In the 1970s, belief in the progressive potential of collective politics gave way to political exhaustion, energy crises, punk nihilism and the growing computerization of society (e.g. the birth of Microsoft and Apple). Berardi (2011: 50) argues that this decade was characterised by a perception of 'the accelerated pace of production, technology and daily life', presciently captured in the central concept of Deleuze and Guattari's *Anti-Oedipus*—deterritorialisation—which can be understood to describe positive feedback processes that break down stable systems and identities. Land (2017) suggests that '[d]eterritorialization is the only thing accelerationism has ever really talked about'. From this perspective, *Anti-Oedipus* is the urtext of accelerationism.

In the wake of the events of 1968, Deleuze and Guattari (1983) asked whether the path of revolutionary politics did indeed lay in a rejection of market capitalism, or perhaps in the opposite direction,

> … in the movement of the market, of decoding and deterritorialization? For perhaps the flows are not yet deterritorialized enough, not decoded enough, from the viewpoint of a theory and practice of a highly schizophrenic character. Not to withdraw from the process, but to go further, to 'accelerate the process' as Nietzsche put it: in this matter, the truth is that we haven't seen anything yet. (Deleuze and Guattari 1983: 239–240)

Deleuze and Guattari argue that societies perform a regulatory function by codifying desire: 'The prime function incumbent upon the socius, has always been to codify

the flows of desire, to inscribe them, to record them, to see to it that no flow exists that is not properly dammed up, channeled, regulated' (Deleuze and Guattari 1983: 33). Different forms of human society have performed this function in different ways, and capitalist societies, in this account, are unique. Whereas earlier societies gave emphasis to the coding of desire, Deleuze and Guattari (1983) argue that '[t]he decoding of flows and the *deterritorialization* of the socius … constitutes the most characteristic and the most important tendency of capitalism' (Deleuze and Guattari 1983: 33; emphasis added).

From this point of view, earlier societies resisted latent tendencies for the State or capitalism to emerge, while contemporary societies seek regulate the unsustainable tendencies of technocapitalist development. Capital deterritorializes the social, but it also compensates for its creative destruction at the level of its institutions by reterritorialising desire onto the ideals of the family, the nation and the consumer.

> The more the capitalist machine deterritorializes, decoding and axiomatizing flows in order to extract surplus value from them, the more its ancillary apparatuses, such as government bureaucracies and the forces of law and order, do their utmost to reterritorialize, absorbing in the process a larger and larger share of surplus value. (Deleuze and Guattari 1983: 34–35)

The usual privileging of stability and identity over instability and difference is inverted here: deterritorialization is the primary process that capitalist society tries to make sustainable. The schizoanalytic method described by Deleuze and Guattari is premised upon this insight. Resisting capitalism contributes to the reterritorialization that capitalism needs to keep its explosive tendencies sustainable. Schizoanalysis involves taking the process further by deterritorializing desire: 'The task of schizoanalysis goes by way of destruction' (Deleuze and Guattari 1983: 311).

This emphasis on destruction, and the source of the claim that accelerationism wants the worst, can be traced back to Nietzche and a fragment that makes an explicit link between acceleration and education. In the notes posthumously collected as *The Will to Power*, Nietzsche characterises education as narrowly focused on its social utility, writing that '[u]ntil now, "education" has had in view the needs of society: not the possible needs of the future, but the needs of the society today. One desired to produce "tools" for it' (Nietzsche 1968: 477). More than a century later, this perspective is arguably even more pertinent, with education conceived as a means for governments to invest in the skills required by the economy of the present. However, Nietzsche observed that modernity involved 'the increasing dwarfing of man' and considered this to be a force that created the conditions for a stronger, more excessive people. Education inhibited what Nietzsche considered to be 'a great process [homogenisation, or deterritorialization] that cannot be obstructed: one should even hasten it' (Nietzsche 1968: 478).

The second major expression of accelerationist thought occurred in the 1990s alongside post–Cold War economic globalization and the emergence of the internet and rave culture. The CCRU at Warwick University brought together a group of theorists and artists around the philosopher, Nick Land, whose reading of Deleuze and Guattari has been pivotal in the development of this line of thought. Land argues that

> '[a]cceleration' … describes the time-structure of capital accumulation. … technology and economics have only a limited, formal distinctiveness under historical conditions of ignited capital escalation. The indissolubly twin-dynamic is techonomic (cross-excited commercial industrialism). Acceleration is techonomic time… (Land 2014: 511)

Land acknowledges that, inevitably, this dynamic will be perceived as a problem demanding a response, and we have seen many examples, from 'slow' movements to calls for ethical AI. However, his writings during this period, including with Sadie Plant and other collaborators, moved away from critical analysis towards theory-fiction hybrids that aim to mythopoetically catalyse acceleration. In a short text published in 1994, which is illustrative of the style and tone of this work, Plant and Land offer an intriguing suggestion regarding the implications of acceleration for pedagogy.

> Alienation used to diagnose the condition of a population becoming foreign to itself, offering a prognosis that still promised recovery. All that is over. We are all foreigners now, no longer alienated but alien, merely duped into crumbling allegiance with entropic conditions. If the schizoid children of modernity are alienated, it is not as survivors from a pastoral past, but as explorers of an impending post-humanity. (Plant and Land 2014: 306)

The future orientation described here is not one premised upon prediction and prescription, but rather upon letting go of attachments to the past, in order to engage with signs from an alien future.

The most recent expression of accelerationism emerged in the 2010s, during the austere aftermath of the global financial crisis and alongside the explosion of big data and the 'AI spring' spawned by Google's success with machine learning. Williams and Srnicek's (2014) *#Accelerate: Manifesto for an Accelerationist Politics* sought to combine the accelerationist sensibility with left political strategy and the Laboria Cuboniks collective fused accelerationism and gender politics in their manifesto, *Xenofeminism: A Politics for Alienation*. The key insights of Landian/CCRU accelerationism have also been developed in the form of 'unconditional accelerationism', which takes the prognosis from an obscure CCRU text as a basic tenet: '[a]t the end of history, no-one will be there to put the brakes on positive feedback systems' (Metcalfe, n.d.). From this perspective, the answer to the question of what is to be done about acceleration, automation and its potentially destructive effects is to let go of our assumption that something can and should be done, that the primary process of deterritorialization can be subordinated to human regulation.

Accelerationism, even if it is not named as such, has also found recent expression in popular media and policy, including in its unconditional variant. Brynjolfsson and McAfee's (2014) influential book, *The second machine age: Work, progress and prosperity in a time of brilliant technologies*, argued that human development has grown exponentially since the Industrial Revolution, yet steadily growing productivity has become decoupled from flatlining returns to labour since the 1970s. Harari (2015) also develops this thesis, in *Homo Deus*, and predicts that 'dataism', the religion of the twenty-first century, will preside over the acceleration of 'the humanist pursuit of health, happiness and power' until 'humans lose their functional importance in the network' and we find out that we were 'just a ripple within the cosmic

data flow' (Harari 2015: 394–395). An Australian report published by the Commonwealth Scientific and Industrial Research Association's (Hajkowicz et al. 2016) Data61 group took it as axiomatic that the law of accelerating returns, as described by Ray Kurzweil in *The Age of Spiritual Machines*, is the primary global megatrend reshaping the economy and policy. In May 2017, The Guardian published a long-form article titled, *Accelerationism: How a fringe philosophy predicted the future we live in* (Beckett 2017), and RAND Corporation recently published a discussion paper titled, *Speed and security: The promises and perils of accelerating everything* (Bouskill et al. 2018). This policy brief, from one of the most influential US think tanks, which exists to 'to help policymakers make decisions that are based on the best available information', references many key accelerationist texts discussed here. Finally, Means (2015) and Sellar and Cole (2017) have considered some implications of accelerationism for education policy and practice.

Despite its occulted development, and the heretical, dystopian character of its more pessimistic, posthumanist variants, accelerationism is coming into ever greater alignment with the future it portends. As a result, its explanatory power is gaining wider recognition and it is becoming a significant perspective in debates about capitalism, technological change and the future. The unconditional variant of accelerationism will inform the argument developed in the remaining sections of the chapter.

Education and Technological Unemployment

This section will begin by surveying literature which argues for how technological change should be managed, including through educational policies that produce the skills needed for tasks that are not easily automated and the new jobs that are predicted to emerge alongside automation. This literature presupposes the sustainability of the 'opportunity bargain', in which the state creates 'opportunities for people through education to become marketable in the global competition' (Brown et al. 2010: 5)—the more you learn, the more you will earn. This will be characterised as the *negative* position, because it assumes that acceleration can be stabilised using the right educational and economic policies, converting its explosive tendency into a negative feedback circuit.

The discussion will then turn to the literature that predicts more dramatic disruption and the potential for educational, economic and political crises. This literature includes predictions that education will not be a viable means to prevent these crises and is instead becoming a trap for increasing numbers of people who invest in it, but do not see the promised rewards in terms of employment and earnings (Brown et al. 2010). This will be characterised as the *positive* position, because it predicts that the explosive tendencies of modernity will continue to accelerate to the point of crisis.

The Negative Position: Sustaining the Opportunity Bargain

There have, of course, been previous periods of anxiety about automation and technological unemployment, and current speculation has been dismissed by some based on historical precedent. In the recent past, computerization has tended to replace some tasks but not others and it may increase the value of, and returns to, the latter. Autor et al. (2003: 1322) have shown that 'computer technology substitutes for workers in performing routine tasks that can be readily described with programmed rules, while complementing workers in executing non-routine tasks demanding flexibility, creativity, generalized problem-solving capabilities, and complex communications'. Anxieties about automation are often over-stated, because routine tasks that are susceptible to automation often cannot be easily separated from non-routine tasks that require 'interpersonal interaction, flexibility, adaptability, and problem solving' (Autor 2015: 27). This explains why, over the period in which computers have become ubiquitous, college-educated workers have experienced increasing earnings and a continued demand for their labour.

Technological change during the twentieth century was skill biased (Katz and Autor 1999) and this was likely due to an increased supply of workers accelerating skill-complimentary technologies (Acemoglu 2002) as access to post-secondary education was progressively widened. However, there was also polarisation between 'lovely' and 'lousy' jobs and associated growth of wage inequalities. Technological change produced

> … rising relative demand in well-paid skilled jobs (that typically require non-routine cognitive skills) and in low-paid least skilled jobs (that typically require non-routine manual skills) and falling relative demand in the 'middling' jobs that have typically required routine manual and cognitive skills. (Goos and Manning 2007: 118)

The conclusion drawn from these analyses is that it will be important to provide people with non-routine skills that enable them to work with machines in complimentary ways, or to perform the tasks that machines cannot. Indeed, the National Academies for Science, Engineering and Mathematics (2017) argues that 'as IT continues to complement or substitute for many work tasks, workers will require skills that increasingly emphasise creativity, adaptability, and interpersonal skills over routine information processing and manual tasks' (National Academies of Sciences and Medicine 2017: 8–9). As Autor argues,

> the issue is not that middle-class workers are doomed by automation and technology, but instead that human capital investment must be at the heart of any long-term strategy for producing skills that are complemented by rather than substituted for by technological change. (Autor 2015: 27)

The *negative* position acknowledges that automation will substitute for some tasks and jobs, but assumptions about skills-complementarity and non-routine skills have produced comparatively modest predictions about the extent of unemployment.

For example, Arntz et al. (2016) found that across 21 OECD countries an average of 9% of jobs are automatable and they are sceptical about the likelihood of mass

unemployment. Building on this work, Nedelkoska and Quintini (2018) found that 14% of jobs across 32 OECD countries are highly automatable (equating to 66 million workers) and a further 32% have a high risk of automation (50–70%). However, the risk of automation is unequally distributed and there will be a disproportionate impact on low-skill workers. Thus, even in scenarios where lower risks of automation are predicted, the number of people faced with unemployment and the need for re-training indicate that substantial policy challenges will arise. The question is whether policy can drive the development of the right skills, and this question has spurred national skills strategies and research programmes that have aimed to identify 'twenty-first-century skills' and effective approaches for developing and measuring them.

Attention to the value of non-routine skills is not new. Nearly four decades ago, Jencks argued that non-cognitive skills had a positive impact on labour market success (Jencks 1979). There is now a growing body of evidence showing that non-cognitive skills have a positive effect on earnings (Bowles et al. 2001) and that soft skills predict and influence success in both economic and social life (Borghans et al. 2008; Heckman 2011). There is a growing demand and reward for social skills because 'computers are still very poor at simulating human interaction' (Deming 2017: 1634). In Australia, for example, jobs requiring people skills have grown by 43% more than average since 1991 (Hajkowicz et al. 2016). Frey and Osbourne (2017) argue that creativity and social intelligence will be required for jobs that cannot be automated. Workers at risk of technological unemployment should thus 'strive to develop skills such as assisting and caring for others, creativity, or persuasion-skills that are likely to remain resilient in the face of further technological advances' (Berger and Frey 2016: 31–32).

The development of 21st century skills has been on national education policy agendas since the 1990s (Adamson and Darling-Hammond 2015) and most OECD countries now integrate 21st century skills into their curricula, although this integration is uneven (Ananiadou and Claro 2009). The National Research Council (2012: 37) found that there is 'statistically significant, positive relationships of modest size between various cognitive, intrapersonal, and interpersonal competencies and desirable adult outcomes'. There are many different frameworks for 21st century skills and a detailed survey is beyond the scope of this discussion, however some examples include critical thinking, flexibility, social skills and developing the capacity for lifelong learning (National Academies for Sciences, Engineering and Medicine 2017).

The need to develop 21st century skills has not, however, diminished calls for more post-secondary education, particularly in science, engineering, technology and mathematics subjects. Berger and Frey (2016) show that new jobs created by automation will require high level cognitive and technical skills obtained from higher education. But while the risk of being replaced by machines declines with level of education (Nedelkoska and Quintini 2018), the questions of 'how much' and 'of what kind' are not easily answered, so the approach taken in many places has been 'more of everything'. The US National Academies of Science, Engineering and Mathematics (2017) observes that '… it is easy to support the idea of education that prepares the workforce for future dynamism in employment opportunities and enables lifelong

learning. It is much more difficult to answer the question of what specifically to teach, and how, in order to achieve that educational goal' (National Academies of Sciences and Medicine 2017: 113). There is no clear pathway from the rhetoric of the opportunity bargain, on the one hand, and knowing whether and how education can deliver on the state's promises of economic growth and social mobility. Indeed, increasing levels of education for increasing numbers of people brings its own problems, as Means (2017) has shown with specific reference to the issue of automation and technological unemployment.

The Positive Position: Confronting the Opportunity Trap

In 2013, Frey and Osborne (2017) predicted that 47% of US jobs would be susceptible to automation. This prediction spurred recent anxieties about automation and the issue has since become a primary concern of governments and international organisations. The predictions look similarly alarming beyond the US; for example, the figure provided for Australia was 44% and a separate study estimated that 59% of jobs are at risk of automation in Germany (Brzeski and Burk 2015). This modelling focuses on the risk of automation at the occupation level, in contrast to the task-based approaches used by the OECD, but Frey and Osborne also assume that improvements in machine learning are changing the potential for non-routine tasks to be automated. While these predictions are also accompanied by recommendations for appropriate education and economic policies, the scale of the predicted impact raises, even more, pressing questions about the capacity for governments to manage such a large-scale disruption.

Higher rates of technological unemployment will place greater pressure on education systems as compensatory mechanisms, but these systems are already struggling to provide people with the rewards promised by the opportunity bargain. From the industrial revolution to Fordism, labour was generally treated as homogenous until human capital theorists argued that education and training increased productivity, earnings and economic growth. The move to post-industrial economies in OECD countries since the 1970s has been propelled by a 'politics of aspiration' (Raco 2009), which impelled people to invest in themselves through education (Feher 2009), based on faith that the global knowledge economy would create continual growth and mobility for the middle classes. Obtaining more and more educational qualifications is an increasingly competitive strategy for gaining positional advantage in 'hollowed out' labour markets (Brown 2006). Positional advantage is a zero-sum game, and so as everyone adopts the same strategy, '[t]he opportunity bargain … has led to an opportunity trap that forces people to spend more time, effort, and money on activities that may have little intrinsic purpose in an attempt fulfil one's opportunities' (Brown et al. 2010: 12).

Predictions of massive unemployment and credential inflation support Collins' (2013) view that education will no longer be able to perform the stabilising role that it has in the past, resulting in a crisis for capitalist society. Of course, Marx argued

that machines taking people's jobs during the industrial revolution would lead to the downfall of capitalism and this has not proven correct over the intervening period. Collins argues that this is because capitalism has avoided crisis through a number of 'escape routes': innovation producing new jobs; creating new markets in new places; finance capitalism untethering growth from production; Keynesian stimulation; and credential inflation keeping people in school longer and, through a hidden form Keynesianism, creating more jobs by expanding education systems (see also Means 2017). However, education is the only viable escape route that is left and its viability will be placed in doubt if the link between education and economic activity that has grown ever tighter in education policy since the middle of the twentieth century is severed. Collins (2013) predicts that capitalist crisis will occur between 2030 and 2050, within the window of much current modelling of risks to jobs from automation. For Collins, the bottom line is that 'technological displacement of the middle class will bring the downfall of capitalism, in places where it is now dominant, before the twenty-first century is over. Whether these transitions will be peaceful or horrific remains to be seen'. The process will play out in complicated ways due to global unevenness in the effects of automation and the distribution of its benefits and negative impacts, as well as complicating variables such as religion, race, ethnicity and nationality, wars and ecological crises.

The aim of this chapter is not to prove that the positive position is correct, even if it were possible, but rather to show that both the negative and positive positions assume significant disruption, but differ on technical points regarding the modelling of risk and on economic assumptions about the sustainability of capitalism and the role that education can play in managing acceleration. If we consider the positive position likely, then we are confronted with reconsidering the function of education in advanced capitalist societies and, more radically, the reworking of pedagogy when human and techonomic time dephase.

Techonomic Time and the Temporality of Pedagogy

The temporality of pedagogy is dictated by human biological and cultural reproduction. As Mollenhauer (2013) observes, having children implies an affirmation of the future and pedagogy manifests the desire to pass on what is best from the older generations to younger ones. Acceleration leading to significant technological unemployment would confront the temporality of pedagogy with a future that can only be affirmed as contingent, thus testing faith in the belief that education can save 'fallen' society and bring it closer to perfection. In contrast, the passage from Plant and Land (2014) cited above calls for letting go of crumbling allegiances to the past and helping the children of modernity to explore our impending post-humanity. There are precedents for reconsidering pedagogy along these lines.

For example, Mead's (1970) examination of the growing generation gap during the 1970s already expressed a sense that this change was occurring. Mead identified a typology of temporal cultural styles, which includes post-figurative, cofigurative

and pre-figurative cultures. In post-figurative cultures, a relatively stable archive of experience is passed down from generation to generation and the future is fashioned in the image of the past. Cofigurative cultures emerge when learning and the transmission of cultural forms occurs through intercultural exchange, technological change, or other events that interrupt the transmission of culture from past to present. As a result of such interruption, learning from the experiences of contemporaries takes precedence over learning from older generations, but this is often short-lived and new post-figurative arrangements tend to emerge. Pre-figurative cultures are oriented toward the future and involve the younger generation producing knowledge for older generations. Mead attributed the rise of post-figurative cultures to the emerging age of planetary computerization: 'Today, suddenly, because all the peoples of the world are part of one electronically based, intercommunicating network, young people everywhere share a kind of experience that none of the elders ever had or ever will have' (Mead 1970: 50). It is possible to argue that, in her concern to understand the generation gap that was opened up by new degrees of planetary computerization, Mead was beginning to theorise the educational consequences of accelerating social, technological and economic processes.

Mead's notion of pre-figurative cultures offers one way to develop the suggestion that younger generations will need to become explorers of post-humanity, but it retains the basic assumption that education can make the future better, only with the child as father of the man. Confronted with the prospect of significant technological unemployment, others have called for the radical reimagination of educational purposes (Means 2017) and a new shared vision of humanist education (Peters et al. 2019). But another approach is to de-emphasise reterritorialization, the codification of desire that is inherent to pedagogy, in order to emphasise the primary process—deterritorialization. Can we go further in the direction of acceleration by breaking down the codifications of desire, beginning with the desire for education to save society? This would be an approach that resonates with negative theological traditions insofar as it emphases letting go rather than identifying a positive programme of action. While this may sound quite mystical, it can be readily imagined in ways that differ only minimally from current educational approaches. All that needs to be subtracted is the soteriology that guides educational thought. Accelerationism is not a matter of wanting the worst (passive nihilism) or wanting nothing (having the void as purpose), but simply letting go of wanting. Everything else could remain the same, although it would also be radically changed (Agamben 1993).

Conclusion

Current debates about technological employment have been shaped by the questions of whether it will be different this time and what should be done. Accelerationism has been a marginal area of theoretical development, but its increasing alignment with the empirical circumstances it predicts has increased its influence in a range of popular media and policy documents. While the most recent developments in

accelerationist thought have offered a variety of answers to the question of praxis, its core underlying thesis suggests that questions of praxis are largely irrelevant, because the explosive dynamic of modernity cannot, ultimately, be regulated. Rather than seeking to arbitrate between different predictions about the extent of technological unemployment, the aim of this chapter was to assume the worst as a strategy for pushing the limits of educational thought.

While accelerationism has been interpreted as wanting the worst, or as the worst kind of nihilism, its unconditional variants both prompt reconsideration of educational purposes and practices and suggest a minimal yet consequential shift in educational thought. Rather than asking what should be done educationally, in order to save society from the risks of technological unemployment, accelerationism prompts us to ask: How far can we go in letting go of the desire for education to solve such problems? If the accelerationist thesis is correct, then this is the only way out of capitalism. But it would be a mistake to see this as wanting capitalism and its crises, or rejecting current educational approaches in favour of 'better' alternatives. Rather, it involves affirming the future, as all pedagogy does, but in a spirit of *amor fati*. Technological unemployment may help us to let go of the persistent myth that education can make the world better.

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Chapter 10
Educating for a Workless Society: Technological Advance, Mass Unemployment and Meaningful Jobs

George Lăzăroiu

Introduction

I follow recent research showing that the notion that education can puzzle out the issue of technological unemployment constitutes a political building, which has mostly been unsuccessful in delivering its promise. Taking a strategic and conducive path single-handedly through university may not secure future work (Peters et al. 2019). The chief insight provided in this chapter is that technological cutting edge may be related to worker displacement over a brief period of time, but the detrimental consequence tends to be reversed because compensation mechanisms lead to greater labour demand. Job losses generated by technological change may be impermanent, being reversed as a broad series of compensation mechanisms give rise to new labour demand (Ugur et al. 2018). Empirical and secondary data are employed to support the claim that the worldwide economy is characterized by wealth imbalance, a decreasing work proportion of total returns and the rise of technological advances with the capacity to disorganize the current consistency of labour earnings. Machines may dislocate some types of work, render millions of jobs superseded and place downward pressure on incomes (Fleissner 2018).

The main objective of this chapter is to demonstrate that both labour production and labour dislocation are associated with various types of groundbreaking undertakings, e.g. product and process advance. The innovation–employment relationship is regulated by direct consequences, by the kinds of compensation mechanism in operation, and by the routes via which such mechanisms perform. The compensation mechanism through a decline in prices should offset the drop in aggregate demand related to workers' displacement (Hyers and Kovacova 2018) with the purpose of operating accurately. The fallouts of distinct kinds of groundbreaking undertakings

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on employment dynamics are reliant on the certain stage of the economic phase in which they take place. Dissimilar levels of aggregation decisively shape the manner in which leading edge impacts hiring and employment growth (Calvino and Virgillito 2018).

I develop an account according to which technological advancements that raise output may cut down the wages. With a flexible labour supply, a decline in the labour demand results in lower employment. Automation generates the replacement of capital for labour (Koppel and Kolencik 2018) as, at the margin, capital operates particular tasks more inexpensively than labour, cutting down the prices of the products and services whose output processes have been automated, making households better-off and raising the demand for products and services. The output effect makes possible greater real returns and consequently higher demand for all goods. The higher demand for labour from other sectors may offset the adverse displacement effect of automation (Acemoglu and Restrepo 2018).

Technological Change and the Precaritization of Employment

The circumvention of deep recessions enhances end results in the labour market greatly over lengthy periods of time, but the failure in identifying substitute employment for displaced personnel may take place notwithstanding the indisputable flexibility of current the labour market. Technological change has influenced organized labour markets considerably, stimulating substantial alterations in the sectoral model of employment over time. On condition that the rate of technological change is not too swift, it brings about adjustments in the pursuit for labour between spheres of the economy (Nica et al. 2017b, c) at a satisfactorily progressive regularity that the labour market may assimilate them without significant aggregate disruption. Throughout the advanced economies, both labour and multi-factor output has been increasing unusually monotonously for some time. Jobs throughout the economy are not proportionately liable to being dislocated by technology and automation. Routine or expected tasks are more prone to dislodgment than non-routine ones (Gruen 2017).

Technology can be both detrimental, by dislocating individuals from their jobs, and resourceful, by generating new jobs. Systems are not likely to thoroughly expel employees but undertake certain tasks for which people are no longer necessitated. Jobs are not wiped out right away but disintegrate steadily. A whole job vanishes if the complete set of tasks that constitute it fails to keep and a new one is not furnished. The resourceful impact of the cutting-edge technologies cancels out its adverse consequences on jobs that consist of tasks. When more labour-saving machines are introduced across an economy and not in an individual firm, the productivity of the economy intensifies (Lăzăroiu 2015a), as with such technology, workers and companies can accomplish more using the same resources. In this large-scale economy, a greater amount of tasks have to be achieved. When advanced machines are installed,

and the productivity of the economy rises, a different bundle of tasks will have to be completed besides the current one. There are particular tasks that are more competently performed by workers, and ones that are more adequately accomplished by machines (Susskind and Susskind 2015).

Technology presents a superior threat to the quality of labour than its quantity. Capitalism has created more labour for individuals to perform and has unfolded no indications of submitting to a system where work is disproved or cultivated for its own goals. The utilization of technology under capitalism has eliminated some components of the deterioration of labour, but it has been unsuccessful in detaching individuals from work. Its aftermath has been to bolster labour, bringing about new determinants of discomfort and discord for workers. Capitalism has generated massive expansions in output as a result of technical change (Smith and Kubala 2018), but only some of these increases have brought about shorter hours of labour. The apparent inconsistency between technical advancement and gradually decreasing or ascending labour hours can be clarified by two aspects. The first pertains to the consequences of consumerism. The second aspect deals with the absence of bargaining capacity of workers. The latter's ability to secure shorter labour hours has been shaped by alterations in the political economy of capitalism (Spencer 2018).

Automation, artificial intelligence (AI) and robotics substitute workers in previously performed tasks, bringing about a compelling displacement effect that can diminish the demand for labour, wages and hiring. The displacement effect entails that rises in productivity per individual deriving from automation will not cause a comparable increase of the demand for labour, and brings about a separation of wages and productivity per worker, and a decrease in the proportion of labour in national income. Automation, AI and robotics may raise labour demand. The replacement of more inexpensive machines for human labour generates an output effect: because the expense of producing automated tasks drops, the economy will develop and raise the labour demand in non-automated ones. The output effect may signify a boost in the labour demand in the same industries experiencing automation (Popescu 2018) or as an expansion in the labour demand in non-automating ones. Capital accumulation set off by advanced automation increases the capital demand and the labour demand. Automation operates at the extensive margin, substituting tasks formerly performed by labour, and at the intensive margin, raising the output of machines in previously automated tasks. This deepening of automation is likely to bring about an output effect but no dislocation, therefore raising labour demand (Acemoglu and Restrepo 2018).

Demand will tend to be adequately elastic if the technology is tackling considerable unfulfilled needs affecting individuals with various options and utilizations for the technology, that is in the upper tail of the allocation function. If AI pursues more satiated markets, jobs will disappear in the affected sectors. The rate of change of a cutting-edge technology is not enough by itself to clarify the latter's effect on employment. If demand is satisfactorily elastic and AI does not thoroughly substitute human workers, technical change will generate jobs instead of suppressing them. A swifter pace of technical change will result in more accelerated employment growth (Popescu and Alpopi 2017) and not in job losses. If AI automates jobs in entirety,

demand no longer influences employment as there is not any necessity for human workers. A while back, notwithstanding large-scale output growth, technology has generally only to a certain extent automated work. If AI brings out totally new goods and services that gain access to otherwise unsatisfied needs and requirements, there may be additional unimagined determinants of employment growth. AI may not generate long-range unemployment shortly, but it will destroy some jobs while creating others. The necessity to reskill and switch workers to new jobs, occasionally in different locations, may be notably troublesome despite the fact that the entire employment rate persists high (Bessen 2018).

Even in its bounded configurations, AI is disintegrating confined barriers of human proficiency and strivings. Emerging technologies should have troublesome effects for workers and workplaces. The character and rate of technological dynamics are qualitatively dissimilar from previous periods (Nica et al. 2017a), as a consequence of the reinforcing repercussions of convergence. As numerous jobs and workers will be influenced by accelerative machine technologies, businesses should redesign their production processes, preserve labour and embrace new business patterns. Workers' roles and skill sets will have to be adjusted to performing apace with progressively efficient machines. Technology not only shapes the mechanisms of job creation, elimination and conversion, but also business patterns and organizational arrangements. Technology should be an offshoot of human resourcefulness, and a generator for the furtherance of human welfare, with results that are governed by human workers' preferences and organizations (Healy et al. 2017).

A remedy to uncontrolled technological breakthrough necessitates a reassessment of capital and of betterment itself. As even innovative mental undertakings are gradually dislocated by technology, profit-maximizing capital being instrumental, cutting-edge advancement is imminent in subverting the determinants of all progress. Labour-saving technological rise has cut down the hours of work required in the creation of commodities necessitated for material existence. Labour that produces non-material value, i.e. services, has intensified consistently. Due to the current commitment to expanding financial earnings to capital, non-market undertakings are unfolded to financial capital on such conditions, setting in motion a biased emphasis on expense decrease entailing regularization, automation and robotization and the dislocation of innovative mental undertakings. If the financialisation and ensuing computerisation of such mental undertakings advance consistently (Nica et al. 2016), the outcome will be a speeding up of technological un(der)-employment, possibly subverting the additional advancement of the human mind. When, by dint of the use of human knowledge to production processes, work is removed, the money that was employed to compensate the neutralized labour also is free (Naastepad and Mulder 2018).

Bureaucracies are essentially algorithms designed by technocrats that organize governance, and their automation directly eliminates bureaucrats and paper. Public servants, technocrats and algorithms epitomize predispositions that are likely to satisfy the interests of high society, and all necessitate openness and democratic responsibility, oversight citizens are inapt to exercise. Because state apparatuses are gradually automated, mechanisms for shared performance and democratic surveillance

should be conjointly automated. Algorithms and cyborg population will implement a post-human democracy. Classlessly responsible algorithmic governance, empowered by artificial intelligence and human enhancement (Taylor and Kliestikova 2018), may systematize disorganized citizen control, inform discussions, amass decision making and arrange the adequate performance of the constantly decaying state. As paid labour vanishes and human workers switch to a post-capitalist society with a universal basic income, democratic planning will substitute market mechanisms. Algorithmic governance may fortify human future against escalating perils from technological advance (Hughes 2017).

Technological unemployment will generate substantial imbalances and a growing breach between the compensations to labour and the ones to capital. With each ensuing trend of technical advance, the intrinsic digital rationalities of the Fourth Industrial Revolution have gone through crucial alterations in pace and scope with an associated priority on mechanisms of abstraction, validation and mathematicization that activate and requite self-determining digital network systems. There is an unrivalled global technical system that allows access to worldwide markets in immediate real time (Koppel and Kolencik 2018) establishing steadily interreliantly scaled markets that overshadow the proportion of the archetypal industrial/colonial system and ascendingly expedites all transactions. Making technological unemployment educational is contingent on the notion of human capital, but without generating new occupations it simply brings into existence a redesigned category of frontrunners in the deteriorating labour markets (Peters and Jandrić 2019).

Automation takes the place of labour and integrates it, boosts productivity in manners that bring about higher demand for work, and interrelates with regulations in labour supply (assignments that cannot be displaced by automation are commonly rounded out by it). The robust harmonious relationships between automation and labour raise output, increase returns and intensify demand for labour. Alterations in technology do modify the kinds of jobs offered and what such occupations pay. The coaction between machine and human contingent ascendancy enables computers to supersede workers in performing standard, codifiable tasks (Popescu et al. 2016) while augmenting the correlative superiority of workers in providing problem-solving abilities, compliancy and resourcefulness. Automation influences the demand for labour by increasing the value of the assignments that workers distinctively supply. Workers tend to gain straightly from automation by supplying tasks that are rounded out by it, but not if they chiefly or completely provide tasks that are replaced. The flexibility of labour supply can moderate wage gains. The productivity elasticity of demand associated with earnings elasticity of demand may either curb or strengthen the gains from automation. Supposing the elasticity of final demand for a certain industry is below unity (i.e. the sector diminishes as output rises), aggregate demand may not decline as technology advances (the surplus returns can be allocated elsewhere). Gains in productivity do not bring about a lack of demand for products and services (Autor 2015).

Cutting-edge technologies constitute complementary aspects in the current decrease of jobs and employment. Automation and precaritization of hiring will exacerbate pressure on instructional systems to carry to completion for the economy and

consequently intensify social discords over educational access, knowledge creation, class and racial hierarchy. Inflexible human capital patterns curtail the efficiency of formal schooling in innovatively satisfy the wide-ranging challenges inherent in a plausible post-work environment by confining the groundbreaking capacity of instruction, knowledge and subjectivity. As technology builds up and expels workers, different employment chances may crop up as technology and leading edge set up new markets and brings about growth via expanding output (Means 2017).

Has Automation Driven Changes in Output that Have Disorganized Labor Markets?

Dissimilarly from previous modes of automation which focused on repetitive manual labour, greatly cognitive jobs are in danger, but extremely skilled and rewarded top-notch workers will frequently possess technological knowledge that coherently harmonizes with managerial duties (Hyers and Kovacova 2018), making their occupations hard to effectively computerize. Digital automation is advancing in an epoch of insignificant growth and little demand. For providers, expanded demand for a commodity with a zero marginal cost has almost no consequence on the quantity of work required to churn it out or even the manufactured article's price. Technological advances are bounded by socio-organizational requirements, which determine why, how and whether occupations and tasks are automated (Fleming 2018).

Confronted with a progressively difficult and unfavourable bargaining setting, numerous workers have agreed to the same or longer labour hours for the same or inferior wages. Capitalism has conceived the capacity for a decline in labour hours, but it has not constantly perfected the conditions to thoroughly carry out this potential. Notwithstanding incessant gains in output coupled to technological advancement, capitalism has generated exigencies that have preserved and even increased labour time (Mihăilă et al. 2018), and it has been instrumental in maintaining and enlarging employment opportunities, extending labour to a more significant proportion of the population. As regards the quality of work, capitalism automated some unsanitary and perilous labour in manufacturing, but it has created in concert more contingent, insecure and underpaid work in services. Technology has meant for numerous workers in the service economy demanding labour with few financial benefits (Spencer 2018).

The generation of cutting-edge tasks, functions and undertakings in which labour has a correlative ascendancy when compared with machines brings about a reinstatement effect unswervingly offsetting the displacement one. The creation of such tasks does not constitute a self-governing process developing at a prearranged pace, but one whose activity and character are influenced by the assessments of companies and workers, and which may be driven by innovative automation technologies. Automation, by dislocating workers, may constitute a more significant labour pool (Taylor and Kliestikova 2018) employable in cutting-edge tasks. Artificial intelligence can

function as a platform to generate advanced tasks in numerous service sectors. The regulation of an economy to the swift launch of automation technologies may be time-consuming and difficult. An inherent discrepancy between the exigencies of innovative technologies and tasks and the abilities of the personnel impedes the organizing of labour demand, is responsible for inequality, and diminishes the output gains from both automation and the initiation of cutting-edge tasks, as it makes the correlative skills required for the performance of advanced tasks and technologies more inadequate (Acemoglu and Restrepo 2018).

Cutting-edge technologies displace labour with machines, and, in a free-enterprise market, automation will curtail prices. Technology may enhance product quality, customization and rate of delivery, possibly raising demand. If the latter intensifies adequately, employment will expand despite the fact the labour necessitated per unit of production decreases. Job losses in a sector may be counterbalanced by employment growth in other sectors. At the sector level, swift labour productivity growth in conjunction with job growth indicates an expeditious growth in the equilibrium level of demand (the quantity consumed should rise satisfactorily to neutralize the labour-saving impact of technology). Cutting-edge technology may create innovative goods that bring about new demand (Koppel and Kolencik 2018), adjusting the distribution or novel alternatives that curb demand. The responsiveness of demand is essential to grasping whether main cutting-edge technologies will curtail or raise employment in affected sectors. Productivity-improving technology will boost industry hiring if product demand is fairly elastic. If the price flexibility of demand is more significant than one, the expansion in demand will counterbalance the labour saving consequence of the technology (Bessen 2018).

Employing the money that is released from production by human knowledge to facilitate individuals whose work is forestalled to further advance and utilize their strengths would fix technological unemployment, the quandary of super-abundant capital, and the likely degeneration of the human mind if, as a result of an excess of information and communication technology (ICT), it is not functional. As human knowledge settles in production processes, it is likely to make labour more undemanding (Popescu et al. 2016), thus obviating it. In the current social and economic circumstances, the forestalled work is likely to turn into joblessness or underemployment. When, as a result of constant innovation, production necessitates increasingly less work, it will be more difficult to attain inclusive economic, social and cultural continuation via output growth. As productivity rises, individuals can either generate the same level of output using a reduced amount of work or can maintain work steady and produce a more significant level of output. The commodities that are required are produced by gradually fewer workers and consequently an increasing component of the labour that before now was demanded to generate goods is no longer necessitated for that objective. The swifter the output growth, the higher should be its level with the purpose of rewarding for the work thereby forestalled (Naastepad and Mulder 2018).

Computer capital is redesigning the workplace cogently in addition to how companies organize production. Output is rising as computers, robots and artificial intelligence alter the manner in which individuals work and cooperate. Middle-wage

jobs, routine occupations, are ceasing to exist, because such tasks can be executed by computer capital. High-skilled workers boost their productivity as a result of their harmonious relationship with computer capital. Cutting-edge technologies can be hard to acquire and consequently necessitate more skills. More knowledgeable workers can take in groundbreaking technologies faster (Smith and Kubala 2018), and thus employers bring on board more skilled individuals. The utilization of robots intensified the intricacy of numerous previously routine tasks. Computer capital is a first-rate alternative for routine tasks, and as computer capital price goes down, companies have a motivating influence to replace computer capital for routine occupations. Firms are dependent on technological disruptions where a cutting-edge technological organization substitutes the dominant one, bringing about undetermined settings (Fonseca et al. 2018).

Automation may not cut down the amount of jobs, but it may considerably influence the qualities of vacant occupations. Individuals in abstract task-intensive jobs gain from information technology through an effective mix of deep-seated harmonious relationships between routine and abstract assignments, flexible demand for services supplied by abstract task-intensive jobs (Mihăilă et al. 2018) and inelastic labour supply to the latter over the short and medium run. Information technology should increase returns in jobs that employ thoroughly abstract tasks and among individuals who effectively provide them. Manual task-intensive undertakings are somewhat inadequately integrated by computerization, do not step on elastic final demand, and confront flexible labour supply that mitigates demand-induced wage raises. Information technology has been greatly instrumental in employment polarization evaluated in amount of jobs, but these employment alterations do not result in a consonant wage polarization (Autor 2015).

A growing supply of skilled personnel through education may be a staple economic growth strategy that produces employment by boosting productivity and speeding up innovation. The employment arrangement and labour demand are chiefly achieved externally to instructional systems via the market, clout and status connections intrinsic to capitalist societies (Nica et al. 2016), whereas the particular knowledge and skills necessitated for most labour are normally assimilated in the process. While workers with relevant levels of education preserve a blatant competitive ascendancy in the labour market, want for middle and high-income employment is inconclusive if not wearing away. Technology heaps on emulation for educational credentials and employment in a hierarchic knowledge economy. Even apathetic endeavours by governments to raise minimum wages, restrict executive pay, hold sway over financial immoderations, and/or increase earnings via progressive taxation are frequently promptly confronted by risks of capital flight and swifter automation (Means 2017).

Educational Attainment and the Logic of Technological Development

With unceasing technological change and automation, there has been a continuous, but salient, decrease in the proportion of manual and cognitive routine jobs and an analogous boost in non-routine jobs of both types. Automation is likely to remove jobs. In contrast, the invention of novel intricate tasks generates new jobs. There have been galore beneficial cutting-edge elaborate tasks invented for individuals to perform (Hyers and Kovacova 2018) that there has been no temporal increase in technological unemployment. With ascending levels of education, individuals have succeeded in becoming proficient at such sophisticated tasks (the ones that are not invalidated by automation are frequently integrated by it). The intensifying complexity of machines may annihilate the invention of such tasks, and consequently, machines may be an alternative for all human tasks (Gruen 2017).

The limits of ascendancy between workers and machines are incessantly changing. As machines advance in becoming gradually proficient, they will continue eroding any prevalence that workers have in carrying out precise kinds of task. Workers cannot depend on additional or inherent demand, mostly as nearly all the extra tasks to which it generates tend to be more competently undertaken by machines. Supposing that there are tasks which entail ethical carefulness and moral accountability (Popescu et al. 2016) that ought permanently to be carried out by human workers and not by machines, a small volume of these will maintain individuals in employment on the current scale. As machines become progressively competent, professionals will not be able to fortify their position endlessly in such partnerships. Joint ventures between workers and machines are as much threatened from being managed exclusively by machines as ones entailing individuals alone. Over time, high-performing, gradually efficient, automatic machines will require less need of workers as teammates (Susskind and Susskind 2015).

As industrial production is conventionally systematized around a multilayered division of labour in which undertakings are separated into uniform and monotonous tasks, factory jobs have permanently been susceptible of being substituted by machines. Digital mechanization has undoubtedly cultivated favourable conditions for the growth of precarious and poorly paid jobs. Bounded automation designates the socio-economic forces that essentially regulate the distribution of digital technologies (Nica 2018) in particular occupational environments. Robotic mechanization is shaped and hampered by the appraisal of work, organizational power links and the character of the task. Digitalization wipes out semi-automated occupations and significantly transforms and/or reorganizes them (Fleming 2018).

Companies may find it more unproblematic and more profitable to employ machines instead of human beings and the likelihood of large-scale automation will result in a reduction in available labour chances. If workers cannot depend on labour for earnings and have no other resources of subsidizing themselves (Taylor and Kliestikova 2018), they will confront economic deprivation. Higher imbalance will arise from circumstances where the earnings from automation proceed to an interest

group in society. The robot owners continue to gain immensely without regard for the surplus of society, who tends to experience economic poverty through the absence of access to income. The utilization of technology to expand marketing opportunities harmonizes with the goal of cultivating labour and consumption (Spencer 2018).

A diversity of aspects establishes an obstacle between the wage and the labour opportunity cost, articulating a socially superfluous automation, which causes a direct inadequacy and serves as a hindrance on output growth. Production generally necessitates the synchronized achievement of a series of tasks that can be operated by a mixture of human labour and machines. Automation entails the replacement of machines for labour and results in the dislocation of personnel from the automated tasks. Automation covers the advancement of more productive vintages of current machines and comprises the launch of innovative machinery to operate tasks that were formerly in the sphere of human labour. Labour-augmenting technological alteration leads to a kind of dislocation (Popescu et al. 2017) if the elasticity of replacement between capital and labour is irrelevant. If the latter is quite inexpensive or fairly beneficial at the margin, automation will make possible the switch of capital for labour in such tasks. This replacement brings about a dislocation of workers from the automated tasks, generating the displacement effect that may lead to a decrease in the labour demand and the equilibrium wage rate (Acemoglu and Restrepo 2018).

Leading edge and critical assessment should be instrumental in a more forward-looking link between instruction and computer industry. With the advancement of the epoch of the digital rationality, manufacture of concrete artefacts and services succumbs to the creation of immaterial ideas. Under cognitive capitalism, a paramount transformation takes place from physical resources to proficiency and brain strength (Smith and Kubala 2018) as both participation and amount produced. Neoliberal reorganization of education consistent with market demands has brought about the rise of a worldwide policy intensification of permanent schooling and commodifiable schooling credentials. As the production line with particular envisioned requirements from the plant and shop floor have ended gradually, education completed around industrial lines should have to be reorganized, instructing learners in keeping with of the worldwide knowledge economy and variable market demands (Peters and Jandrić 2019).

The rise of information and communications technologies have shaped job demands in workplaces, by assisting companies expediently and cost-effectively in locating, checking and regulating elaborate production processes at various locations globally and adjusting competitive requirements for corporations and workers. Jobs are constituted of numerous undertakings and even if automation and computerization can take the place of some of them, grasping the synergy between technology and employment necessitates considering the series of tasks entailed in occupations (Nica 2018), and how human labour can frequently integrate cutting-edge technology and depends upon analysing price and income elasticities for various types of productivity, and also labour supply feedbacks. The tasks that are most difficult to automate necessitate adaptability and reasoning. Several tasks in numerous middle-skill occupations are susceptible to automation, but a lot of them will still necessitate a combination of tasks covering the skill spectrum, mixing repetitive technical tasks

with the series of non-routine ones in which individuals hold contingent advantage: interpersonal collaboration, compliance and problem-solving (Autor 2015).

Worldwide competition and cutting-edge technology progressively put in jeopardy the socio-economic status of workers. As labour market instability has stepped up and the neoliberal state diminishes its position in direct hiring (Nica et al. 2016), formal education is more thoroughly involved in a worldwide competition for access to social capital, degree certificates and feasible employment chances. As students deal with mounting degrees of debt with the aim of securing and financing their access to college, families will require a significant rate of return on capital spending that may not be supplied by governments and the economic system. As societies and learners get involved in the same strategies to obtain a competitive advantage, instruction participates in decreasing returns on investment. A college diploma is a condition for access into even the inferior layer of the labour market. Eventually, the relevance of a college degree may decrease as the amounts of learners completing them rise. Attaining an unbiased, labour-saving and ecologically viable political economy may necessitate joint efforts over the developmental educational cultures and organizations that are instrumental in the creation of knowledge and the regulation of social coaction and agency (Means 2017).

Conclusions

The pursuit for means to cut down expenses makes possible the automation of operations and the dislocation of labour, and it brings about new work consequently to a certain extent by furthering the determinant to hire labour. As far as technology enlarges the pool of available individuals by giving rise to more indistinguishable types of work (Lăzăroiu 2015b), it exerts downward pressure on wages in manners that make it more appealing for employers to continue hiring labour. With the mechanisms of automation, personnel will experience not joblessness but to some degree more and inferior quality work (they will continue being employed in jobs that have almost no intrinsic value) (Spencer 2018).

Human capital investment should be at the centre of any long-run approach for producing skills that are integrated by technological change. If human labour is made redundant by automation, the main economic issue will be one of allocation, not of shortage. The chief system of returns distribution in market economies has been based on labour scarcity (Popescu and Alpopi 2017): individuals possess or assimilate an array of relevant human capital, that as a result of its insufficiency, gives rise to a flow of earnings over the career route. If machines were to render human labour superfluous, economies would have massive aggregate wealth but a difficult task in clarifying who controls it and how to distribute it (Autor 2015).

Instead of an impetus for boundless separate upward success, human capital consolidates the logic of exiguity and declining earnings, whereby expansion of credentials is employed as an assessment mechanism that spuriously generates impediments to access preferable job opportunities. There is a possible plight of rightfulness

for the intensely instilled account of economic progress (Smith and Kubala 2018) and interminable upward mobility via distinct educational investment. The legitimacy deadlock is mitigated through the permeable coating of excellence supplied by neoliberal notions of market freedom and self-standing compensation through the labour ethic, construed dominantly as a commitment to instructional upgrading for workforce training. (Means 2017).

Based on previously debated research (especially Acemoglu and Restrepo 2018; Fleming 2018; Susskind and Susskind 2015), I conclude that the rampant forecast of mass unemployment is implausible to be carried through as AI and digitalization are hindered by socio-economic and organizational influences that regulate its putting into practice. Automation does not straightly strengthen labour but alters the output process in a manner that enables more tasks to be operated by machines, being an enlargement in the series of tasks that can be generated with capital. Machines can carry out very challenging tasks, and frequently outclass workers, by performing in totally distinct manners from human beings. Progressively proficient machines will increasingly undertake non-routine tasks.

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Chapter 11
'Employable Posthumans': Developing HE Policies that Strengthen Human Technological Collaboration not Separation

Sarah Hayes

Introduction

Higher Education (HE) policy for human learning through technology has, in recent decades, persistently separated the performance of people (in terms of their labour and work) from machines, through the power of words (Hayes 2014; Hayes and Jandrić 2014; Hayes and Bartholomew 2015; Hayes, forthcoming 2018). The discourse around Technology Enhanced Learning (TEL) is just one example, which has been critiqued by a number of authors:

> Technology enhanced learning implies a value judgment: the word "enhancement" suggests an improvement or betterment some way. (Price and Kirkwood 2010: 772).

Furthermore, an economic calculation embodied within the terminology of TEL: *in exchange for the use of technology, there will be enhanced forms of learning*, needs to be questioned (Hayes and Bartholomew 2015). Elsewhere, I have argued that:

> This is quite a presupposition given that technology means different things to different people in different situations and cannot simply be assumed to have inherent positive qualities where learning is always enhanced. (Hayes and Jandrić 2014: 198)

The 'assumption-of-enhancement' approach towards educational technology in university policy discourse has hampered the development of more critical understandings of how humans and technologies mutually constitute each other (MacKenzie and Wajcman 1999). Indeed, as Matthewman puts it, the argument that humans 'have always been posthuman,' is to say simply that: 'we are never prior to, or independent of, the very technologies, companion species and environments that help to constitute us' (Matthewman 2011: 176). Whilst this understanding is considered to be a positive one, alongside the rapid development of technologies, a deterministic rhetoric about their role in driving forward society, education and work

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tends to be the more dominant concept. Both of these understandings of technology need to be considered though, with regard to wider capitalist social relations, and not as an isolated issue concerning technological progress alone (Rikowski 2003).

Contemporary transformations of capitalism, in the form of neoliberalism, have caused widespread shifts in social relations. One example is the increasing 'marketisation' of universities over the past two decades and the construction of students as 'consumers', who simply exchange their time and money for a university education that is expected to 'deliver' future work. Another is a tendency to claim 'universal status' for such representations and visions of economic change (Fairclough 2003: 45), for example, within 'employability' strategies in our HE institutions. Yet such clear-cut, rational narratives, often based on 'exchange value' (Marx 1867), now need to be challenged, alongside assumptions that technology will enhance such aspirations. This is important when many writers are predicting unprecedented disruption to work as we know it, through a Fourth Industrial Revolution wrought by technological automation (Brynjolfsson and McAfee 2011; Frey and Osborne 2013; Doucet et al. 2018). The current strategic, instrumental and individualistic routes students are encouraged to take through university will not guarantee future work (Peters et al. 2019). In the light of predicted technological unemployment, a new emphasis on changes to the curriculum is urged, with a call for universities to 'begin to teach people to do what machines cannot' (Aoun 2017: 19). In this chapter, I argue that such changes need to be accompanied by new ways of writing HE policy.

In previous studies, Critical Discourse Analysis (CDA) has offered a window on the problems of taken-for-granted visions of neoliberal social development in policies related to education, technology and employment (Peters et al. 2019). Close examination of written HE policy texts has revealed a prevalence of deterministic rhetoric, with frequent attribution of human labour to a series of buzzwords. These arguments are designed to persuade people of a particular reality, where technology, or educational techniques, are expected to 'fix' societal issues (Selwyn et al. 2001; Hayes 2016; Aoun 2017: 17; Peters et al. 2019). However, this reasoning is also based on a 'deficit' model, in relation to the labour of both teachers and students, within a wider audit culture (Shore and Wright 1999). Additionally, a closer look reveals no good reasons for such arguments, but instead a series of simplistic assumptions. These include the notion that people, skills and institutions can be treated as detached, uniform and quantifiable, rather than complex entities, with contextual characteristics and human agency, intermingled with our mutually constitutive technologies. Other common suppositions in HE policies include the idea that introducing technology will always be a 'positive' and that digital learning will be experienced evenly and equally by all students. These points alone demonstrate that the way in which policy is written, urgently requires attention. Therefore, in this chapter, I argue that, in response to impending technological unemployment, HE policy discourse needs to fundamentally shift, alongside any changes to the curriculum and support structures for graduate employment, that experts may recommend.

This chapter will proceed to examine firstly, some problems that have arisen from taken-for-granted visions of neoliberal social development related to HE, technology, and employment in written policy. Both government and university

strategies for HE have tended to emphasise 'techno-fixes' and 'edu-fixes', where humans are frequently linguistically detached from their 'tools' in policy statements. Citing examples from a corpus-based CDA, I will draw attention to 'employability agendas', which appear to be concerned with student futures, but are closely linked to university marketing. Students are discussed as if they were a series of 'parts' to be assembled on the 'graduate attribute' production line, ready for employment and as a feature of their university's 'brand'. However, such an approach does not acknowledge 'the new geography of work', where 'today's institutional boundaries are no longer demarcated so cleanly' (Ross 2008: 45). Writing policy in this way also fails to give 'a voice' to colleagues or students, in their diverse locations across the neoliberal university (Couldry 2010).

Second, this chapter suggests, that despite 'a seemingly inextricable higher education bog we have allowed ourselves to become implicated in' (Smyth 2017: 28) there are more promising routes that might be explored in responding to the question: *What is the role of education in a digital age of potential mass technological unemployment?* New avenues of understanding in HE policy that move from a rational, deficit model of enhancement towards enrichment are suggested. This would acknowledge diverse human strengths, in the form of collaboration with our tools and with each other. It would avoid the assumption in policy discourse that enhancement is something beyond humanity that is wrought by technology, and instead understand enhancement through technology as always 'an inherently human act' (Lawrence 2017: 171). Couldry argues that when we lose the capacity to 'narrate things about ourselves' we move closer to treating people as if they are not human (Couldry 2010: 1). Drawing on posthumanist theory reveals a symbiosis between humans and machines that is completely missing from the existing HE policy discourse for employability. I argue there is no better time for us to 'write this in'. Human collaboration with technology can lead to enriched outcomes that are far better than those achieved independently via humans, or machines, alone. However, this requires an appetite for an honest and radical reimagining of HE policy that acknowledges and discusses the future of human work as co-evolving with our new technologies, and not separate from them.

Work and the Neoliberal University

Changes in HE in recent decades have politically repositioned universities as engines of economic growth (Finlayson and Hayward 2010: 1). As such, the notion of the 'employability' of graduates beyond their study period has become educationalised to a point where the term itself, ceases to be questioned (Hayes 2019). Since around 2012 there has been a rapid increase in the number of strategy documents produced by universities to address the topic of 'employability' in a generic manner that assumes that all students are the same. At the same time, more traditional academic values of research, teaching, learning and free inquiry have become somewhat eroded, with increasing emphasis placed on students as 'consumers' getting value for money and

institutions improving their efficiency (Bartholomew and Hayes 2015). Linked to this has been a widespread assumption transmitted via HE policy discourse that new technologies can (in themselves) enhance the effectiveness of education. This simplified view suggests that technology provides an exchange value where learning is always 'enhanced'. Additionally, recent attention through the media and governing bodies focused on Value for Money (VfM) in HE has intensified the pressure on universities to demonstrate that their graduates are gaining direct routes towards future employment (Skoulding 2017). Universities have therefore produced employability strategies which infer that, as students 'exchange' their fees for a university education, the skills they develop will 'deliver' future work.

It would appear that, underpinning university strategy for both TEL and employability is a basic policy discourse that emphasises an 'exchange value' (Marx 1867). Concepts like 'learning gain' (HEFCE 2018), which have recently emerged are dialectically intertwined with this understanding, based on a rational linguistic calculation which looks something like this: *student enrolment at university = gainful employment* (Hayes 2019). But what if it doesn't? What if all the student engagement in the world doesn't yield employability because work, as we know it, has diminished due to automation? Whilst it is important that universities support students towards gaining meaningful employment (however work may alter in the near future), existing policy discourse risks short-changing students. The current strategic, instrumental and individualistic routes students are encouraged to take on their journeys through university will not guarantee future work (Peters et al. 2019).

It would be misleading though to simply say that the world of work is only just about to change. Across centuries now, humans have been experiencing the introduction of technologies that threaten to destroy jobs. However, digital technologies are considered by some to be different, in their potential to destroy more jobs than they create (Brynjolfsson and McAfee 2011; Frey and Osborne 2013, 2015). Others have recently built on these conclusions to predict that:

> The highest automatability is found among jobs held by youth. The risk then declines to reach its lowest value at age 30-35 and then gradually increases again. (Nedelkoska and Quintini 2018: 115)

In the light of these findings, the role of universities will be key, as 're-qualification is an important mechanism to aid the transition from more to less automatable jobs' (Nedelkoska and Quintini 2018: 115). It is worth reflecting then on what universities currently do, particularly in regard to how HE employability policy may need to change. Nedelkoska and Quintini argue:

> If teen and student jobs are about to decline, education and training will have to find different – possibly, class-based – ways of helping youth prepare for the labour market. Separate policies will have to address the elevated risk of automation among "older" jobs. Future research should focus on the effectiveness of life-long learning, and in particular adult education in helping older workers transition to safer jobs. (Nedelkoska and Quintini 2018: 116)

These are important observations, given that many universities have over the last few years simply developed 'employability' strategies that treat graduate employment in a 'one-size-fits-all' manner (Hayes 2019). As textual examples below will

show, generic statements in current employability documents are misleading. Universities have fallen into the habit of developing a set of strategies that individually respond to each new government agenda, but this hinders more holistic understandings and risks contradictions across such strategies. Additionally, HE strategies concerning the use of technology for learning fail to reflect cultural developments that have altered our relationships as humans with both technologies and with each other.

University Employability Strategies Need to 'Catch Up'

Aside from automation, considerable changes to how many humans work have already taken place over the last two decades. Ross (2008) discusses the cultural and informational activity around people that have caused work to be 'increasingly distributed from sites of production to the realm of consumption and social networking' (Ross 2008: 45). These changes have seen humans become inextricably interlinked with their personal electronic devices, text messages, emails, video and communication tools. Referred to by Gregg (2013: 2) in her book *Work's Intimacy,* as *presence bleed* and *function creep,* firm boundaries between professional and personal identities no longer apply. These once separate experiences have become fused via communications across digital media. It, therefore, makes little sense for university strategy documents to discuss technology as if it were an entity separate from humanity.

Yet despite our intimate relationships with our digital tools, that now constitute extensions to our very being, HE policy for learning through technology has persistently separated people from a promise of 'what technology achieves' (Hayes 2014; Hayes and Jandrić 2014; Hayes and Bartholomew 2015). Technology is discussed in a detached way, as something to 'embed' and to achieve goals *on behalf of humans*, rather than in cooperation *with humans*:

> e-learning will be firmly embedded in the curriculum as a means of enhancing the quality of teaching, meeting students' expectations and responding to the needs of the workplace. (Aberystwyth e-learning strategy 2005–2009)

The example above is not intended to single out any one university for writing in a particular manner. An approach that infers that 'e-learning', rather than humans, is achieving all of these things (enhancing the quality of teaching, meeting students' expectations and responding to the needs of the workplace) is common across many university strategies, as my previous writing has demonstrated. However, despite writing this chapter over a decade later than the above strategy, such statements can still be widely observed in HE policy:

> The TEL strategy aims to drive forward the innovative use of educational technology across the disciplines to enhance the student learning experience. (University of Surrey Technology Enhanced Learning Strategy 2013–2017)

Here the wording implies that it is 'the TEL strategy' (not human beings) that aims to 'drive forward the innovative use of educational technology across the disciplines

to enhance the student learning experience'. In *The Labour of Words in Higher Education* (Hayes 2019), I demonstrate how textual patterns like these are repeated across a range of HE strategies, such as those written for 'the student experience', 'student engagement' and 'employability'. In each case, these documents seek to persuade people that a technology, a strategy or an educational technique will 'fix' societal issues in some way (Selwyn et al. 2001; Hayes 2016; Aoun 2017: 17; Peters et al. 2019). However, this is a form of rationality that not only reinforces a 'deficit' model in relation to people, by failing to acknowledge the labour of both teachers and students, it also appears to ignore changes taking place to the ways in which humans work, and new forms of automation, that cannot possibly leave universities unchanged.

After investing heavily in a degree, students understandably require support to help them to prepare for future employment. Universities seek to demonstrate that their graduates are in demand by employers, so there are vested interests all round. The term 'employability', just like 'student engagement' sounds like an unquestionably positive strategic ideal. However, a closer look at the wording in university employability strategies reveals certain issues. Firstly, the dominant discourse of employability furthers the notion of fragmented labour, in the form of isolated skills students are expected to generate, to 'fit' with the perceived requirements of employers. Second, these strategies do not appear to anticipate how students might be supported in a world without work, where more complex and creative approaches may be needed. Instead, a rather 'fixed' vision of student success is expounded as an ideal that ignores impending technological and related social change. Employability discourse that appears to be concerned with student futures, upon closer scrutiny, often prioritises university marketing. A simplified and impersonal logic that pervades many HE strategy documents, therefore, has implications for the topic of Education and Technological Unemployment. Whilst many universities have been active in producing student 'employability' policies and undertaking projects concerning student 'learning gain' (HEFCE 2018), on concerns of impending technological unemployment, HE policies are noticeably silent. In scrutinising employability strategies through CDA it is not my intention to argue against helping students to gain meaningful work, but instead to point out that there are problems to consider if future employment (for any of us) is too narrowly interpreted as 'employability'.

Corpus-Based Critical Discourse Analysis of Employability Strategies

During 2017, a corpus of UK university employability strategies was gathered. A corpus can be understood as a large bank of text, in this case, one consisting of 103,112 words compiled from 28 UK university documents. These strategies are freely available to download from institutional websites. Once collected, they can be searched using software to establish what linguistic patterns are repeated across the

texts. Corpus linguistics (Baker 2006) offers structured ways to search text files and examine constructions of language in use, or discourse. After these initial quantitative searches, a more qualitative analysis can be conducted through CDA (Halliday 1994; Fairclough 2003). Different approaches may be taken towards CDA to evaluate how meaning might be construed from written statements, but I have been interested for some time in 'nominalisation'. Nominalisation offers 'a less specific representation of an action', thus 'eliding those involved in the process' (Simpson and Mayr 2010: 6). By examining how policy statements are formed through the positioning of nouns and verbs, it is possible to notice where a person who would normally enact a process of human labour is obscured. This may not be a conscious form of deception by the writer, nor is it confined to the writing of policy, but it has wider effects on how human labour and work can come to be viewed over time.

There is not scope in this chapter to explain CDA techniques in detail, so for a fuller discussion on corpus-based CDA please refer to these publications (Hayes and Jandrić 2014; Hayes and Bartholomew 2015; Hayes 2016, 2018; Peters et al. 2019; Hayes 2019). In the following CDA examples I will demonstrate how certain 'truths' are communicated about university education and future work, as part of the wider 'employability agenda'. Threats from technological unemployment are not specifically addressed in these policies, with emphasis instead placed firstly on how graduates might 'add value' to the workforce, by shaping themselves to fit the needs of the labour market:

> For employers, we seek to create a university that is responsive to the needs of the labour market, ensuring our students and graduates can add value to their workforce. (University of Bolton Employability and Enterprise Strategy 2014–2017)

This suggests that universities will 'react', rather than 'act' to take the lead on advising employers about the implications of significant changes to work. The next example also reinforces a notion that the degrees students are studying are being designed to serve the goal of 'maximum value' to employers:

> Ensure that all courses have the highest available level of professional body accreditation to ensure maximum value of the students' degree to employers. (Anglia Ruskin University, Employability Strategy 2015–2018)

Aoun suggests, however, that whilst universities state they need to match skills to what employers want, a better model would be to work closely with employers, but also acknowledge this is not a one-way dialogue. Universities have a role too in developing how employers respond to the unprecedented speed of technological unemployment (Aoun 2017: 147). In the following examples from Employability Strategies written between 2014 and 2017, the statements below have been broken down to demonstrate how the arrangement of verbs and nouns in a particular way influences meaning. The person or entity 'acting' as part of a process is highlighted in bold text (the noun). The process itself (or verb) is underlined and the goal achieved is shown in italics. These examples typically demonstrate a trend where students are discussed in terms of the required 'attributes' they should develop and bring to the workplace, but it is worth noting that, due to nominalisation, any human labour or

actions are generally concealed. Instead, a non-human entity enacts each process in a pattern that is often repeated. The actions of humans are attributed to 'The Graduate Attributes Framework' or 'the Awards', 'the University' or 'the Employability and Enterprise Strategy':

> **The Graduate Attributes Framework** will enable all departments to review *their provision* and assess how the **attributes** are delivered *within programmes of study*

Not only does this wording suggest an odd reporting relationship for the academic departments, this is also not helpful for acknowledging all of the work that university quality teams perform alongside departments, when they are reviewing taught provision and seeking re-approval of programmes. Next, it is the turn of 'the awards' to do a little 'work' in the example below:

> **The Awards** will provide *further opportunities for students* to reflect on **attribute development**

How exactly will 'the awards' provide and communicate this form of reflection to students? Awards don't hold office hours for students, write their feedback or attend their graduation ceremonies. Next, it is 'the university' that is said to have identified the key areas of provision, rather than departments:

> **The University** has identified *a number of key areas of provision that* directly address *graduate attributes and employability*

Given that many universities now have employability teams, it is reasonable to question what they will be doing, if 'the university' is enacting their role. In the next two examples, responsibility to 'ensure' that certain skills, qualities and attributes are embedded in the curriculum and evaluated falls to a 'strategy' and the university's 'governance structure', respectively:

> **Key strategic priorities of the Employability and Enterprise Strategy for 2014-2017 are** to ensure that *the skills, qualities and graduate attributes aligned to employability and enterprise are* embedded *effectively within the curriculum*
>
> **The University's governance structure for education** should ensure *oversight and ongoing* evaluation *of the effectiveness and outcomes of the delivery of the strategic framework for employability*

It is important to ask though, 'effectiveness' for whom? Employability seems to be as much a marketing tool for universities, as it is a student-centred activity, as the next example reveals:

> **Coordination of marketing across these functions** is required to ensure *the presentation of a coherent brand to the market*

As already observed, it is 'coordination of marketing across these functions' (not a human being) that is required to undertake the labour of 'presentation of a coherent brand to the market'. Additionally, it seems as if a one-way route of universities serving the market is emphasised, rather than the expertise within universities also being called upon, to advise the market. Yet even more disturbing observations can

be drawn from the next set of examples where the discourse suggests we are simply rendering our students down for 'parts' on the 'graduate attribute production line' (Hayes 2019).

The Graduate Attribute Production Line

It is a curious thing that, at a time when many writers are predicting that digital technologies are set to destroy more jobs than they create (Brynjolfsson and McAfee 2011; Frey and Osborne 2013, 2015), in universities we respond only to produce repetitive employability strategies that declare the delivery of generic 'graduate attributes' (Peters et al. 2019: 249). For some universities, this also involves the selection of a particular number of such attributes, or capabilities, as in the examples below where 'five' and 'nine' seem to have been randomly defined:

> Define and articulate five graduate attributes which enable Westminster graduates to thrive in their personal and professional lives as highly employable, socially responsible and globally engaged citizens. (University of Westminster – Employability Strategy 2015–2020)

> Embed opportunities for students to develop the nine capabilities/Graduate Attributes of employability & professionalism. (University of Bradford Employability Strategy 2012–2015)

It seems then that between five and nine graduate attributes ought to do it. That is apparently all that will be needed to 'enable' graduates to 'thrive' as professionals. It seems fortuitous too, that along with being 'employable', these graduates will also be 'socially responsible' and 'globally engaged' as citizens. How could any institution possibly ensure these things across *all* of its graduates?

In some employability strategies the concept of 'embedding' such graduate attributes into the curriculum is deemed important and in others, the concept of 'graduateness' is discussed:

> Embed the graduate attributes in the learning outcomes across the undergraduate curriculum. (University of Westminster – Employability Strategy 2015 – 2020)

Can a set of graduate attributes be so easily 'plugged in' across a curriculum as if they were a new technological appliance?

> A set of core attributes and capabilities are identified by graduate recruiters as indicators of their needs and as hallmarks of 'graduateness'. (University of Kent Employability Strategy)

The above statement now begins to sound like a shopping expedition, where an employer recruiting a graduate simply selects the required 'hallmarks' of 'graduateness'. Complex, multi-layered practices of learning and applying personal skills become treated in this discourse as if these were simplistic processes applicable to all. Unfortunately, whilst these pragmatic approaches may appear to be supporting students towards employment, there are problems in any assumption that the learning of, and ability to apply, such generic capabilities will be evenly experienced by students. Czerniewicz and Rother (2018: 1) argues that in university strategy documents

'the intersection of inequality and educational technology at an institutional level has received little attention'. This point can be extended to include at this crossroads, the intersection where inequality and educational technology also meet with learning and employability strategies.

Robot-Proofing the Curriculum Needs to Be Reflected in University Strategy

The examples of employability strategy discourse discussed so far seem to almost invite machines to take over from us as humans. Not only are these written in a repetitive, nominalised manner, they take a passive approach where universities simply serve up a set of student attributes for employers. Aoun points out that instead of educating students for jobs that will disappear, universities need to 'liberate them from outdated career models and give them ownership of their own futures.' (Aoun 2017: xiii). He develops a model for students to thrive in a new economy defined by technology, through continued access to the learning they need to face the challenges this new revolution has wrought upon us. This 'robot-proofing' of the curriculum takes the form of 'humanics'—the new literacies, cognitive capacities and cultural agility that 'integrate to help students rise above the computing power of brilliant machines by engendering creativity' (Aoun 2017: xix). In placing Aoun's approach alongside this statement from the current employability discourse, however, I suggest that more than the curriculum alone requires attention:

> The equipping of all graduates with these **attributes** is integrated *as an objective of* **all aspects of the curriculum**

Don't busy lecturers integrate the content of their curriculum, by designing learning outcomes and assessments and seeking the committee approval necessary for any changes? Curriculum design is time-consuming work for academic programme teams, yet here it is 'all aspects of the curriculum' that is undertaking this task. Aoun argues that 'to stay relevant in this new economic reality, higher education needs a dramatic realignment' (Aoun 2017: xii). I argue that, alongside the review of the curriculum, this must also include how universities write employability strategy.

Maintaining a Series of Myths

Current HE employability strategies perpetuate a series of myths, some of which can also be noticed as they become repeated across other strategies, such as those for technology enhanced learning and student engagement (Peters et al. 2019: 244). First, the myth that numerous social issues can simply be 'educationalised', has seen universities repeatedly responding with a related strategy for each new social agenda that

gains political attention (Peters et al. 2019). This changes the nature of HE, if universities are simply seen in terms of their contribution to the 'problems to be solved' (Fendler 2008: 55). Such a reactive role for universities needs to be questioned.

Furthermore, a 'new-topic, same-language' approach towards HE strategies cannot withstand the global developments in automation described above. A re-think is needed where university policy no longer simply trots out statements of what technology enhanced learning, student engagement or employability will achieve, as if these words were realities we can 'embed', and not just socially constructed ideas. Another central myth that underpins these arguments, and seems particularly important in the face of technological unemployment, is the notion that innovation itself signifies progress (Dinerstein 2006: 573). The point that 'we have confused rapidity of change with advance' (Dewey 1916) seems to have stood the test of time, given that this logic is still to be found in strategies that argue that 'the use of technology' can 'enhance', 'increase' and 'improve' almost anything in HE. More than ever though, this state of affairs now indicates an astonishing divide between the linguistic structure of HE policy documents and the nature of human experience and relationships with technological progress, in wider society.

Digital Relations Are More Than a Mechanical 'Quick Fix'

As humans, we were always intimately connected with our tools. Tool-making was one of the key defining features of humanity, with our relationship to various kinds of tools defining our historical progress and social organisation (Marx 1976). Once our tools, such as stone knives or hammers, were individual, but since the Industrial and Digital Revolutions, tools have grown too complex for individuals, and have strongly contributed to the organisation of society including, but not limited to, the division of labour (Jandrić and Hayes 2019). In digital society, we have become inseparable from our technologies, to the point that they are merging with our human bodies. From artificial limbs and eyes, to wearable health devices, through to algorithms and apps that co-decide what we buy and who we meet, technology now intervenes in driving, housework, personal security and many other human activities. Yet in relation to technological learning or graduate employment, HE policy discourse fails to reflect these changes. Instead policy rhetoric persistently separates the performance of people and their work from machines, through the power of words. The discourse is stuck in a time warp where technology is discussed mechanically, as if it can provide a simple 'quick fix' for a complex range of social issues (Selwyn et al. 2001). Additionally, an audit culture approach has failed to address the pressing concern of digital capabilities for both staff and students. A one-size-fits-all approach has also failed to acknowledge uneven experiences and diversity. In Science and Technology Studies (STS) theory, technology, like language, is never innocent or neutral (MacKenzie and Wajcman 1999). Posthuman understandings can offer a way forward though from narrow policy texts. It is time for us to recognise that the

ways in which we respond to technology for both learning and labour are an inherent part of our humanity.

Posthuman 'Enhancement' or 'Enrichment'?

There are those who interpret the 'posthuman' in terms of forms of 'enhancement' (Bostrom 2009). The state of 'transhumanism' might then be understood as referring to something of a transitional stage, before humanity has transformed into posthumanity. Posthumanism is used by some theorists as a collective term to understand 'any discursive or bodily configuration that displaces the human, humanism, and the humanities' (Halberstam and Livingston 1995). Others though question the idea of 'moving beyond' human, to ask 'whether enhancement can truly lead to something beyond humanity, or whether it is, itself, an inherently human act' (Lawrence 2017: 171). Lawrence suggests that the notion of leaving humanity behind as 'a posthuman entity' is dangerous and misleading. Any transition that suggests certain human qualities could be left behind, as technology 'enhances', is relevant to the critique of policy texts discussed earlier. This is because these empty linguistic structures devoid of any mention of human labour leave humans vulnerable to being replaced by automation, rather than being enriched alongside. Campbell et al. (2010), suggest that in the twenty-first century 'far from being a mere tool, technology is the centre of critical thought about culture and about nature' (Campbell et al. 2010: 86). They add that 'posthumanism is fundamental to theorising humanness in an era that is witnessing the complexification of new technologies. To follow a posthuman mode of thinking will lead to important ethical and metaphysical insights' (Campbell et al. 2010: 86). This leads me to put forward the idea of a mutual human-technological 'enrichment' for further exploration within both HE policy and the curriculum. This is inspired by a posthuman stance that 'pays attention to the lives of nonhuman others' (Campbell et al. 2010: 98) and I include as 'nonhumans' the very statements in policy that are said to enact human labour.

As humans use technology, technology changes 'human nature' (Campbell et al. 2010: 98) but it should not displace it. Technology, written policy and humanness co-evolve in complex ways. Campbell et al. (2010) argue that:

> While not everything is technical, everything is technological. (Campbell et al. 2010: 98)

With these ideas in mind, it is problematic that so many university strategies in recent decades have indicated how inanimate objects and machines will 'enhance' learning, engagement and employment. In the statements from TEL and employability strategies that I have shared, human labour is shifted aside linguistically, to make room for technology to independently cure any issues by moving beyond human capability. This furthers the myth that HE can simply 'fix' society's dilemmas and call upon technology for back up. If we move away from generic ideals of what technology might 'enhance' in relation to human performance, then we can make room

to explore how individuals and technology might be mutually 'enriched', through posthuman encounters.

Conclusions

When education is one of the most powerful forces for creating the conditions for the future of humans, it is time to question why we still discuss students in educational policies as if they were any other type of consumer, simply purchasing a product bearing instructions for the workplace, rather than benefitting also from the transformative potential university education offers for the whole of life (Hayes 2015). We need to ask first, why we make references to 'the student experience', 'the 'body' of the curriculum or 'the student body' as if these were fixed, unchanging entities (Hayes 2017). Work is not a fixed entity either and so I have called into question repeated attempts to 'fix' a range of societal issues (such as student engagement, employability, sustainability, digital capabilities) by 'educationalising' these into static university strategies. This approach lacks careful consideration of changes, both in demographics and diversity across student populations, and in relation to predictions of impending technological unemployment in a digital age.

Therefore secondly, rather than simply responding to what employers seek currently, universities need to cultivate more holistic policies that do not reduce graduate labour to a series of parts. If we are to face technological unemployment with confidence in universities then policy needs to catch up with our nature as employable posthumans. This requires new ways of writing what we actually mean as humans, rather than allotting academic tasks to a series of nouns. Humans need to be written back in, so that rather than looking 'beyond' human matter, we can instead address the question of 'why does it matter?' (Lawrence 2017: 179). Yes, many universities have 'employability policies', but they don't yet have 'technological unemployment policies'. HE needs to urgently establish policies for new routes of cooperation between humans and technology, rather than driving separation between them, if we are to meet the challenges of the 4th Industrial Revolution. Human collaboration with technology can lead to outcomes that are far better than those achieved independently via humans, or machines, alone. However, this requires an appetite for an honest and radical re-imagining of policy that acknowledges the future of human work as co-evolving with our new technologies, and not separate from them.

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Chapter 12
Career Guidance and the Changing World of Work: Contesting Responsibilising Notions of the Future

Tristram Hooley

Introduction

In 1930, John Maynard Keynes wrote an essay to his grandchildren setting out the future as he saw it. The future looked bright. People would be getting more time to choose what to do with their lives. Self-determination and self-actualisation would become real possibilities for an ever-growing number of people. Perhaps even more excitingly, Keynes wrote that these changes would lead to an increase in altruism and social solidarity. As life becomes less brutal, the best of humanity will thrive and the principal problem will be 'how to live wisely and agreeably and well'. Keynes optimistically predicts that in such a situation 'the nature of one's duty to one's neighbour is changed' and that 'it will remain reasonable to be economically purposive for others after it has ceased to be reasonable for oneself' (Keynes 1930: 7).

This essay by Keynes is frequently misunderstood in contemporary writing about the future of work, for example by the International Monetary Fund (2018: 6) who describes the essay as warning about 'technological unemployment', or dismissed as naïve and outdated, for example by Hagel et al. (2017: 27), writing in the *Deloitte Review*, who concludes that 'we've long since given up on early twentieth-century utopian visions of a leisure society in which machines do almost everything for us'.

A recent discussion on the future of work has taken a more dystopian turn. Ford's (2015) influential account of the 'rise of the robots' and the 'jobless future' has been picked up in popular culture and political debate. Headlines in mainstream newspapers examine 'Why we need to protect our income from robot automation' (Independent, 12/05/2018); 'Ten million British jobs could be gone in 15 years. No one knows what happens next' (The Guardian, 30/04/2018); 'Robots interviewing graduates for jobs at top city firms as students practice how to impress AI' (The

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Telegraph, 21/04/2018); 'Artificial intelligence: Hero or villain for higher education?' (Forbes, 18/05/2018) and 'How you can raise robot-proof children' (Wall Street Journal, 26/04/2018). Anxiety about the future abounds with accounts often tipping into alarmist predictions.

The world of work is changing, so the story goes, and for the most part, it is not changing for the better. We better get ready for these changes, otherwise we are at risk of barbarism. The robots will take over and there will be nothing left for humanity. The story about automation is part of a broader narrative, which I call '*the changing world of work*'. The changing world of work story includes ideas about how individual's careers are changing, how organisations are changing, shifts in working culture, the encroachment of globalisation and the influence of a wide range of technologies beyond automation.

YouTube includes many films that address the topic of the changing world of work. An example is offered by Next Generation Recruitments 'How the world of work is changing', which was the first broadcast in 2016. The film adopts a jaunty style to explain a series of interconnected changes that people have seen, or should expect to see, in their working lives. It shows how technology mediates organisational processes like recruitment and management, how organisational boundaries are crumbling, self-employment is growing, women have moved into the workplace while formal dress codes have moved out and how some organisations now allow staff to work from home, take longer holidays and even support them to freeze their sperm and eggs to prolong their pre-family working life.

The Next Generation Recruitment film combines discussion about technological change with an examination of political, cultural and economic change and serves to obscure the differences between these different types of change. It frames the changes that it describes as inevitable rather than contestable and defines the good life people should aspire to by emphasising the value of the work ethic and of consumption over family and community. It is underpinned by an argument about the quickening of economic, organisational and technological change and the need to adapt and keep on adapting in response to these changes.

'How the world of work is changing' is not unique. Films talking about how the world is changing are familiar to anyone, who uses the Internet and are used regularly in career-related workshops and presentations. Such films are underpinned by a wide range of reports, which make similar arguments. In this chapter, I will explore some of these reports to illuminate the changing world of work concept.

This chapter explores the changing world of work narrative in relation to the activity of career guidance. Career guidance professionals are charged with helping individuals to manage their relationship with education and work by helping them to decode the labour market and the education and training system, to think about themselves and their place in the world of work and to develop strategies for advantageous engagement with this world (OECD 2004). Career guidance is used as an umbrella term to describe a range of approaches to helping individuals to develop their careers, which draws on education, counselling and human resources practices. While the term is often used to describe face-to-face, one-to-one career counselling interactions where a professional supports the learning and reflection

of an individual, increasingly this is seen as just one amongst many possible interventions with alternatives including classroom-based career education, experiential encounters with workplaces and working people and the provision of information and interactions online (Andrews 2011; Hooley 2012; Mann et al. 2014).

Career guidance is a global activity with Watts (2014) reporting that formal reviews of career guidance policies and systems have been conducted in 55 countries and that it is likely that the activity is practiced in many more countries. The Organisation for Economic Cooperation and Development (OECD) (2004) has argued that career guidance can support three main policy areas: (1) the effective functioning of the labour market and through this the economy; (2) the effective functioning of the education system; and (3) increasing social equity. These rationales have made career guidance perennially popular with policymakers, who frequently invest in the activity with specific and utilitarian aims. Practice and policy are underpinned by a growing evidence base that highlights how career guidance can contribute to both individuals' career development and to these wider policy goals (Hooley 2017; Hughes et al. 2016).

In this chapter, I will be seeking to understand how career guidance addresses the changing world of work, in part through a thematic analysis of the promotional materials used in recent careers conferences. I will be arguing that the changing world of work concept has been taken into the mainstream of the rhetoric of the career guidance field even though it is both contestable and politically aligned to neoliberalism. I will conclude by arguing that career guidance needs to relate to the changing world of work in a far more critical way both by offering individuals the tools to critique such notions and by opening up opportunities to build more emancipatory paths into the future.

Understanding the Changing World of Work

There is an extensive public debate which addresses the changing world of work and asks how we will work in the future. This debate is conducted in part through a series of policy and research reports. This grey literature describes how work is changing, theorises these changes and offers advice to a wide range of actors about what should be done. Some reports focus on the individual and their career management, others on the organisational implications of the changing world of work and still others make suggestions for public policy. As individual reports such papers come and go, rarely making any kind of substantial impact. But as a collective body of work, they constitute a steady drip feed of ideas about the future of work, which are regularly picked up by the press, profiled at career guidance conferences and discussed amongst those with an interest in the future.

To explore the conception of the changing world of work contained within this body of grey literature I have identified and analysed 30 papers. These papers were identified through a Google search using the strings 'filetype:pdf changing world of work' and 'filetype:pdf future of work'. The criteria for inclusion was that there

Table 12.1 Breakdown of the changing world of work literature by organisational type

Organisational type	Example organisations	Number of papers
Consultancy	McKinsey & Company, Deloitte	8
Think tank	Institute of Economic Affairs, Centre for International Governance Innovation	7
Supra-national organisation	OECD, International Labour Organisation	4
Professional/employers association	Design Council, National Employment Services Association (NESA)	4
Tech company	Atos, Fuse	2
Recruitment company	Adecco, ManpowerGroup	2
Other		3

had to be a report or paper rather than a short article or blog. They also needed to have a date of publication so that I could be sure of when they were published. All articles published in academic peer-reviewed journals were excluded. All papers were produced between 2015 and 2018 and the types of organisations which produced them are set out in Table 12.1.

I read all of these papers and coded them into 51 inductively derived themes. All papers were then re-read and re-coded based on the complete codebook. The papers reveal a high degree of agreement about the causes, nature, consequences and potential responses to the changing world of work. They argue that technology is a key driver of such changes (mentioned in 29 of the 30 papers), and that the key technologies that are driving change are automation (26), growing digital connectivity (10), big data (10), 3D printing (6) and augmented reality (3). Other possible drivers of change are also acknowledged with demographic change (12), globalisation (11), the 'great recession' (5), environmental change (4) and urbanisation (3) the most commonly cited alternatives. But, even where these wider changes are acknowledged they are typically given less attention than technology. Some papers note that technology is not destiny and highlight that it is 'how humans respond to the challenges and opportunities' that will 'determine the world in which the future of work plays out' (PWC 2017: 10). However, technology and technological development are generally externalised and viewed as separate to and superordinate to the social and political responses to it.

There is some optimism about the way in which the world of work is changing, with papers highlighting the way that it will increase productivity (12) and innovation (5), give individual's opportunities for flexible and remote working (7) and change the nature of work to make it more creative and less routine (5). The most optimistic paint a utopian picture of workplace freedom, flexibility, creativity and opportunity.

> The future of work is innovative, flexible, lean. Its employees challenge hierarchies, self-organise, and readily share ideas with their small teams. Its managers re-think everything

> from office furniture to wellness, enabling and empowering rather than ordering and controlling. Its smart offices sense employee mood and automatically take measures to reduce stress. And its hiring practices are shaped by the new realities of skill obsolescence and a global market of talent that can easily look elsewhere for work. (van Hooijdonk and Hewlett 2017: 6)

Despite the optimism, there are also concerns about the way in which the labour market is going to be restructured (19) with fears that it will lead to increased unemployment (17), the growth of the casualised 'gig' economy (15), shifts in job content (13) and a growth in underemployment (5).

Often the opportunities offered by the changing world of work are balanced with the dangers. For example, the McKinsey Global Institute (2017: vi) argue that 'automation technologies including artificial intelligence and robotics will generate significant benefits for users, businesses, and economies, lifting productivity and economic growth' but also go on to recognise, in common with many other reports, that these benefits might not be evenly shared amongst the population and that one possible consequence is the growth of inequality (13). There is generally little of Ford's doom-mongering about the collapse of capitalism, but for many of the authors of these reports, the prizes of the transformed workplace will only manifest if individuals, organisations and governments attend carefully to the risks.

Individuals are expected to be adaptable in the light of the changing world of work. A positive mental attitude, a 'growth mindset' and a willingness to be flexible are viewed as key attributes. In addition to agentic adaptability (Global Institute 2017: 12), individuals are expected to embrace the opportunity to work seamlessly with machines (6), to desire the different kinds of work–life balance that are facilitated by flexible working (5) and to exhibit entrepreneurship (4). EY summarise the attitudes and behaviours that future workers will need to possess as follows.

> The idea of work needs to be reimagined. Professionals can no longer regard education as a phase of life that occurs before entering the workforce. Continuous education and the ability to adapt to new tasks and processes will be crucial. Individuals should also expect that a job on the market today may no longer exist tomorrow; preparing for a new work path should be a constant quest. Millennials and people entering the workforce should explore different careers, in order to gain exposure to diverse fields of work. (EY 2018: 4)

Organisations also need to change and become more flexible if they are to make the most of the opportunities offered by the changing world of work. Farsighted leadership is required to make the most of the opportunities (11) and drive the necessary changes in organisational culture and structure (19). As the ManpowerGroup (2016: 3) note, 'business as usual is a thing of the past'. At the heart of this is a need to recognise that workers are no longer going to be tied to organisations in the same way as in the past and that business leaders will have to learn to lead and manage boundaryless organisations populated by protean careerists. The psychological contract between employer and employee is expected to change (22) with the growth in flexible and freelance working. Millennials, it is anticipated, will be particularly keen on driving such a change (6).

These changes raise issues for public policy. The growth of flexible workers and dynamic boundaryless organisations will require action from the government if it is going to play out in ways that do not destabilise society through the growth of inequality. The government has a critical role of putting in place policies and frameworks to ensure the maximisation of human capital. There should be increased investment in education (18) designed to drive the development of skills in general (18) and soft in particular (20). The development of 'soft skills' (variously named as 'transferable skills', 'future skills' and 'twenty-first century skills') is central to the idea of how human beings will need to respond to the changing world of work. Many of the papers propose the skills that are required, setting out frameworks and discussing the role of the education system in developing these skills. The Foundation for Young Australians (2017) talks about the need to develop 'work smart skills', which will include both academic and technical knowledge and skills (e.g., maths, science and the ability to use advanced technologies) as well as written and verbal communication, interpersonal skills, problem-solving, judgement and critical thinking.

Such skills form a curriculum, which individuals should aspire to, businesses should use to inform their human resource development processes and governments should use to guide the reform of the education system. Such reforms should focus on increasing the availability of retraining and lifelong learning (12), improving the use of technology within education (8) and increasing the integration between education and employment (7), including the provision of careers and transition support services (5). Although 'career guidance' is rarely named in these reports, the vision of a reformed education system is one in which career guidance would have a much stronger position. Education in general, and career guidance in particular, have a vital role in developing workers with the right skills, in encouraging a positive orientation towards change and a willingness to adapt and participate in reskilling and transition learning.

While human capital policies dominate the discussion of the role of government there is also a recognition that a range of other public policies could help to underpin the changing world of work. Concern about inequality leads to discussion about the importance of welfare systems and safety nets (10), universal basic income (7) and other forms of redistribution. Even less commonly other reports talk about the importance of planning and co-ordinated strategic responses to the changes and challenges in the labour market, e.g. changing employment law (8), developing or signing up to international labour standards (4), and Keynesian style investment in the public infrastructure to stimulate jobs (3). Some emphasise the importance of the social partners (trade unions and employers) to such strategic responses (4).

The changing world of work literature argues that there is going to be a fundamental change in the way work is organised. It views new technology as the primary, but not only, driver of this change. While the anticipated changes will bring many positives, there is a recognition that the opportunities may not be equally shared around society. To address this, individuals are entreated to be adaptable, organisations willing to change and politicians prepared to address the challenges that will emerge.

The political response is focused around education, training and the development of skills—especially soft skills.

The picture of the changing world of work that is contained within these papers is, perhaps unsurprisingly, strongly influenced by neoliberal rationality. Individuals are viewed as participants in a competition state, who are required to exhibit an 'entrepreneurial subjectivity' (Scharff 2016). The future of work is viewed as one in which there will be winners and losers and in which the responsibility for success lies primarily with the individual. Although the state may have some role in revising the rules of the competition and compensating for its worst failures through limited redistribution, its primary role is, as Cerny (2010: 1) says, is 'to ensure that citizens keep up with the multiple pressures and demands' of the competition. This is imagined as being done primarily through investments in human capital development and this, in turn, is where career guidance can interpolate itself as a key resource for the contemporary state in supporting individuals to accommodate and acclimatise to the changing world of work.

How Career Guidance Addresses the Changing World of Work

The picture of the changing world of work that is contained within the grey literature reviewed above is familiar to me as a regular participant in career guidance conferences and as a consumer of the professional literature of the field. Concern about change and the speed of change in the world of work are legitimate concerns for an area of education that is focused on helping people to learn about and manage their engagement with the world of work. The agentic and individualistic approaches to managing these changes that are advocated by the changing world of work literature aligns with much theory and practice in career guidance which often serves to enculturate people into neoliberalism. Additionally, or alternatively, career guidance can individualise people's experience of their career and decontextualise them from 'socioeconomic and cultural factors and restraints', promising them in effect that they should follow their dreams and it will all work out (Hooley et al. 2018: 15).

It is, therefore, interesting to examine how career guidance specifically addresses the changing world of work concept. Again, I gathered 30 examples to explore the positioning of the changing world of work concept in the career guidance field. In this case, I used the strings 'careers conference', 'career conference' and 'employability conference' to conduct searches on Google and Event Bright for conferences aimed at career professionals. Results were included in the sample if they provided information on general (rather than sectoral or single organisational) career conferences and if they provided information about the rationale for the conference in English. The information provided was then analysed and coded inductively resulting in 12 codes. All information was then re-read and coded against the full codebook.

Around half of the conferences reviewed did not address the changing world of work directly. Generally, these conferences were focused on the expectations and requirements of government policy (14 of the 30 conferences) and did not discuss the future of the labour market or the education system explicitly. Such a find reminds us that career guidance is largely a state-funded activity and consequently it is an area that is directly shaped by the whims and priorities of government.

Slightly over half of the conference did include discussion of the changing world of work as part of their rationale (16). In these cases, the future of work was generally described as being challenging (14) and necessitating a new kind of response from both careers professionals and individuals. New technology was seen as a critical driver of these labour market changes (13) with automation explicitly mentioned by a minority (4). Globalisation was viewed as the other important driver of the changing labour market (7). Such changes were generally viewed from the perspective of the individual, who it is argued will need to become more agile and adaptable (13), to develop new digital skills (4), anticipate a change in the psychological contract with their employer (2) and retire later (1).

The clearest articulation of the changing world of work theme was offered by the AGCAS (2018) conference for careers professionals working in UK higher education. The theme is 'Future Proof—Responding to the Revolution' with the conference promising to answer questions about 'What does employability mean in the midst of the fourth industrial revolution?', 'How will AI, automation and big data transform our clients' careers and our own?' and 'How do we demonstrate our value by being agile and responsive in a rapidly changing world?'.

Most careers conferences reproduce the changing world of work narrative. A change is coming, driven by technologies and individuals should expect that it will rewrite many of their assumption about their careers. If they are going to survive in this changing world of work, they will need to be able to respond to these changes flexibly. Resistance is likely to be futile and there is a little acknowledgement that they might have a role in shaping these changes collectively or politically.

The analysis conducted for this chapter highlights the close alignment between the wider public policy debate about the changing world of work and the way that these issues are taken up and debated as part of the practice and professional development of careers professionals. If we have concerns about the way in which the changing world of work rhetoric constructs the future and narrows what is possible and contestable it is important to think about how these concerns can be addressed within the education system. Career guidance offers a key place that such education can take place, but if it is going to allow learners to contest some of the assumptions inherent in the changing world of work discourse, career guidance will need to find a new emancipatory register.

The Invisible Force of Continuity

The changing world of work narrative, both as it is articulated through the grey literature and as it is represented in the discourse of career guidance, is based around the central assumption that change is the primary and most important force in society and for people's careers. It is easy to notice things that have changed over the course of our lifetimes and so there is a tendency to focus on such changes and to ignore the importance of continuity. The narrative of the changing world of work urges us to pay attention to change and to change ourselves, our businesses and our societies in response to it. However, the idea that we are in a period that is changing more than ever is contestable.

In the UK, we are fortunate to have good historical labour market data, which allows us to look at how the labour market is changing over time. Very little of this data suggests that we are seeing radical shifts in the way that work is structured and organised. For example, job tenure has stayed remarkably consistent over the past 40 years (Burgess and Rees 1996; Urwin and Parry 2016). Self-employment has risen substantially, particularly since the recession, but still only accounts for around 15% of the UK workforce (ONS 2018a). The overall employment rate has remained remarkably stable over the past 50 years and is currently at its highest ever recorded level (ONS 2018b). And most people still work for businesses with more than 50 employees (DBEIIS 2017). Such differences between rhetoric and reality are important for those involved in career guidance as it changes the way in which individuals understand what is happening in the labour market and shifts the way in which they might plan their engagement with it and anticipate their likely future.

The fact that there is a lot of continuity within the UK labour market does not mean that the labour market never changes. Rather it means that it is important to notice that the overall speed of change is typically gradual. Close attention to labour market structures reveals how such changes relate to wider political and economic forces as much as to the technological and cultural shifts that are highlighted in the changing world of work narrative. So, the CIPD's (2013) investigation into changes in job tenure concludes that job tenure has been *increasing* in the UK for 10–15 years. The CIPD attributes these changes to public policies like the minimum wage and shifts in the way occupational pensions are arranged, to organisational innovations around employee engagement, to the recession and to an ageing workforce. In other words, while the world of work might be changing, it is changing fairly slowly and in response to a range of identifiable influences, at least some of which can be contested.

An important corrective to the changing world of work narrative is, therefore, to contest both its explanatory power around current labour market trends and its predictive power around the future. Technological (and other) changes are nothing new and there is no reason to believe that we are in a unique period of history where change is happening more rapidly or more fundamentally than ever before (Denning 2015; Shackleton 2018). Labour markets have historically been able to adapt to previous waves of automation without the total number of jobs going into decline.

Furthermore, it is important to recognise that just because something can be done technically does not mean it will become the new paradigm and that upwards trends will often peak before they become dominant. So, home and remote working has been a feature of the UK labour market for over 100 years (McOrmond 2004) and has been steadily rising to comprise around 14% of employment by 2014 (ONS 2014). However, there are many challenges for individuals, managers and organisations in successfully implementing homeworking arrangements which mean that it is doubtful that such arrangements will become the dominant paradigm in the foreseeable future (Beauregard et al. 2013).

Implementing change is neither straightforward nor inevitable and there are many factors that mitigate against rapid change in the labour market. Short-termism within businesses and a lack of capacity to innovate and implement technological change often slows down or prevents anticipated changes (Dundon and Howcroft 2018). Human beings remain both cheaper and more flexible than robots in many cases (Shackleton 2018). There are also considerable legal, ethical and societal hurdles to the implementation of new technologies and other features associated with the changing world of work (OECD 2017). One of the most obvious examples of this is driverless cars. Much of the technology already exists to enable a shift, which could have profound implications for people working in the logistics and service sectors. But, such changes rely on the development of a new ethical and legal framework capable of assigning blame in the case of accident and death. Developing such a framework is complex and raises issues about what end we are trying to achieve (Hevelke and Nida-Rümelin 2015) and such contestability inevitably places decisions into the political domain where they can be influenced by public opinion and by the lobbying of vested interests including the car companies, environmental and safety lobbies and trade unions.

Case studies of technology like the driverless car remind us to be sceptical of technological determinism. There are many ways in which different technologies can be deployed and public policy, employer behaviour and the expectations of individuals all set the context within which the career and employment consequences of such deployments will be played out. Career guidance has the potential to play a range of roles in helping individuals to understand the rhetoric of change, interrogate it and consider what the implications are likely to be for individuals, communities and societies. The analysis of the career conferences suggests that such critical engagement with the changing world of work may not be the norm and that career guidance is often swept up in the rhetoric of the inevitability of technologically driven change. Given this, it is now important to consider the politics of the changing world of work and to begin to consider how educational activities such as career guidance can relate to them.

The Politics of the Changing World of Work

Technology is not an external force, which acts on or is acted on by politics. As Febvre (1935/1983: 14–15) wrote in his reflections on the history of technology, 'technological activities cannot be isolated from other human activities. Securely enclosed by them it is driven by their action, individual and collective…technology undergoes the influence of general history: and, at the same time, acts on history'. Such a perspective radically shifts the assumptions that can be found in the changing world of work narrative that technology is an external driver of changes in working life to which individuals, organisations and societies have to respond. Rather technology is positioned as something which is mutable, contestable and intertwined with politics.

The mutability of technology and its integration with wider social change opens up radical possibilities for career guidance. The changing world of work narrative focuses the problem on the individual, asking—how are you going to adapt to the change? Career guidance has frequently served as a handmaiden to responsibilisation by encouraging people to focus individual responses and emphasising 'career adaptability' as the core construct for individuals to develop in the face of a changing world (Savickas 1997). The point made by Febvre, challenges this focus on career adaptability and brings important new questions into the wheelhouse of career guidance: How do you use technology? How would you like to use technology in your life? How is technology being used by employers—and how should it be used? How can you influence, shape, resist and encourage the development of technology in ways that are beneficent? Such questions are empowering and encourage individuals to remember that they have both individual and collective agency and that technological changes are contestable rather than inevitable.

Braverman (1974/1998: 133) extends this point by highlighting the role that power and ownership have in determining how new technologies are adopted and utilised. 'Machinery' he writes is 'the instrument of those to whom the accumulation of capital gives the ownership of the machines' and it 'has in the capitalist system the function of divesting the mass of workers of their control over their own labor'. He goes on to make a prescient critique of the changing world of work narrative by noting that it is 'ironic that this appears perfectly 'natural' to the minds of those who, subjected to two centuries of this fetishism of capital, actually see the machine as an alien force which subjugates humanity!'.

Where technology acts as an important driver of change in people's careers it does so within a social structure characterised by inequalities of power where the consequences of technological change are felt differently depending on where you sit in the social hierarchy. As Buchanan (2018) notes social media and its adoption by employers as a form of surveillance drives those about to enter the labour market into forms of self-commodification and immaterial labour. While employers may welcome the opportunity to review every aspect of potential workers' lives in advance of employment, labour market entrants often object to this and seek to subvert it (Hooley and Cutts 2018). Similarly, Moore and Robinson (2016) argue

that the development of wearable devices in the workplace increases the capacity of employers to surveil workers, drives overwork, stress and burnout and encourages the internalisation of structural and organisational problems and oppressions. None of these technological changes are inevitable nor predetermined. Rather technologies are developed for particular purposes and deployed to serve the interests of those who have the power and control over their development. Braverman's machines are now acting on our psychologies and our bodies to maximise the accumulation of capital, and the changing world of work narrative is one of the ways that we are convinced that this is natural and inevitable.

Illuminating the fact that technology and power are intertwined and that they structure the rewards and benefits that are generated through work should be an important part of career guidance. If career guidance seeks to help individuals to understand the labour market and to build a career, it also needs to help them to understand that the working world is structured by class, ownership, capacity to develop technology and the exercise of power. Importantly it needs to call attention to the way in which existing structures and power relationships define not only the present but also the path which is taken into the future. Such analysis poses career problems that are not easily solved through adaptability and individuals' action. Building a meaningful response to such problems is likely to require collective and even political action and this is likely to make new demands on career guidance professionals.

This is not completely new ground to the field with Law (1981) and more recently Thomsen (2017) already exploring how collective and community perspectives can be introduced into career guidance and a range of writers examining how critical and emancipatory positions can be introduced into practice (e.g. Bengtsson 2018; Hooley 2015; Precarious Workers Brigade 2017). With respect to the changing world of work narrative this might include engaging with campaigns such as that advocated by Srnicek and Williams (2016), who transform concern about automation into a political manifesto based around four interlinked demands: (1) full automation; (2) the reduction of the working week; (3) the provision of a basic income; and (4) the diminishment of the work ethic. Adopting such a manifesto offers a different kind of response to the changing world of work, albeit one which remains concerned with helping people to build a personally satisfying career. Political demands and political action should not be viewed as a distraction from career development, but rather as a different way to progress. Indeed, in some circumstances collective and political action offers the best, or even the only way, through which personal advancement can take place.

Critically Rewriting the Future Through Career Guidance

The analysis of career conferences presented above suggests that career guidance can often be deterministic, uncritical and responsibilising. At its worst, it suggests that many in the field have adopted a narrative of the future which serves the interests

of neoliberalism and narrows the opportunities for human action down to the ability to manoeuvre within existing structures. However, this is not the only role that career guidance can take. It is also possible to imagine career guidance taking a more critical role, which encourages individuals to think about the future in different ways.

There is a radical tradition within the practice of career guidance, which goes back to its origin as part of late nineteenth century and early twentieth-century progressive movements (Zytowski 2001). Such traditions have been picked up episodically across its history and infused by ideas from critical psychology, radical education, and critical theory (Hooley et al. 2018). To draw this tradition together and increase its centrality to the career guidance field, Hooley et al. (2018: 20) propose a new definition for career guidance which emphasises the possibility of collective action as well as individual agency, of building a critical account of the world as it is and as it could be and, critically, of bringing into view the importance of 'leisure' alongside learning and work.

> Career guidance supports individuals and groups to discover more about work, leisure and learning and to consider their place in the world and plan for their futures. Key to this is developing individual and community capacity to analyse and problematise assumptions and power relations, to network and build solidarity and to create new and shared opportunities. It empowers individuals and groups to struggle within the world as it as it is and to imagine the world as it could be.
>
> Career guidance can take a wide range of forms and draws on diverse theoretical traditions. But at its heart, it is a purposeful learning opportunity which supports individuals and groups to consider and reconsider work, leisure and learning in the light of new information and experiences and to take both individual and collective action as a result of this. (Hooley et al. 2018: 20)

This definition provides a very different basis for career guidance's engagement with the changing world of work discourse. It would encourage career guidance practitioners to critically explore the changing world of work rhetoric and to encourage discussion about in whose interest such a narrative works. It further asks that they consider both what is contestable and what kind of instruments and actions might allow things to be contested. For example, discussions about the changing nature of the psychological contract and the growth of the gig economy take a different direction when information about the Independent Workers Union of Great Britain's successful campaigns to change the practices of cycle courier companies is introduced (Hinsliff 2018).

Such discussions highlight the contestability of economic and labour market changes and also resituate career as a collective endeavour, which people do together rather than an individualistic participation in the competition state. Rather than offering people one option (develop your skills, get a new job and stop being a cycle courier) a more emancipatory position opens up new options through which individuals can develop their career (join or form a union and work collectively to improve your pay and conditions). In a previous article (Hooley 2018) I looked at how career guidance could encourage critical engagement with automation. In this, I built on an earlier emancipatory curriculum framework (Hooley 2015) focused on the questions:

- Who am I?
- How does the world work?
- Where do I fit into the world?
- How can I live with others in the world?
- How do I go about changing the world?

These questions can be used to organise curriculum content in ways that allow critical interrogation of ideological, but seemingly 'common sense' notions like 'we are all going to be replaced by robots'. An emancipatory career guidance would help people to understand what labour market changes were taking place as a result of automation and what skills needed to be developed to participate in the changing labour market. But, it would also encourage people to consider the political economy of automation and think about different individual, collective and societal responses to it. Encouraging learners to take a historical perspective on such questions and to engage in the analysis of power and vested interests provides a new and interesting perspective on their own careers. If this is then combined with an opportunity to think about both the collective dimension (that we are all careering together) and the possibility of changing not just yourself, but also the world and the structures around it, it radically resituates the focus of career guidance.

Career guidance remains an intensely practical and personal area of education. People seek it out because they want help in locating themselves in the world, in making decisions and in navigating structures. Such practical groundings can raise doubts about how far it is possible to address concerns politically and to propose collective and transformational answers to people's immediate questions. The changing world of work rhetoric potentially opens up a space, where we are invited to think beyond the immediate and the day-to-day grind of finding a course or job. At its heart is the argument that fundamental changes are happening to the world and it is important that we think radically about our position within the world. In the words of Mark and Engels (1848/2010: 16), this is an example of the 'constant revolutionising of production' which means that

> all fixed, fast-frozen relations, with their train of ancient and venerable prejudices and opinions, are swept away, all new-formed ones become antiquated before they can ossify. All that is solid melts into air, all that is holy is profaned, and man is at last compelled to face with sober senses his real conditions of life, and his relations with his kind.

The changing world of work rhetoric represents a moment when we are told that 'all that is solid melts into air' in such a situation career guidance's role becomes absolutely to help people to come to terms with the 'real conditions of life' and to develop a range of possibilities about the future. In this chapter, I have argued that the changing world of work narrative provides a narrow set of ideas about what is possible in the light of labour market changes. I have also argued that these possibilities tend to individualise and responsibilise the career solutions that are open to people and to justify them with contestable notions of how the future is likely to unfold. Against such a backdrop career guidance can encourage people to take a critical perspective and to expand the range of possibilities that are open to them.

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Chapter 13
Graduate Employability (GE) Paradigm Shift: Towards Greater Socio-emotional and Eco-technological Relationalities of Graduates' Futures

Nataša Lacković

Introduction: A Move to Relational Employability Paradigm

Graduate employability policies foreground human capital and neoliberal concepts of employability and work at the majority of universities globally (Peters et al. 2019; Allen et al. 2012; Sin and Neave 2014; Moore and Morton 2015; Li 2013). This means that policy makers worldwide are placing an emphasis on higher education's role to 'enhance' graduates' 'employability' by 'enhancing' student *individual* competition capacity for ever-decreasing and rapidly automated jobs in the labour market (Allen et al. 2012; Sin and Neave 2014; Moore and Morton 2015). UK universities are now expected to fulfil this role as one of their key goals (HEA 2013). Therefore, many universities in the UK and internationally have a strong focus on graduate employability (Tymon 2013; Jayasingam et al. 2018). Whereas it is certainly good and desirable to support graduates to find a job and progress in their career, the long-lived and widely applied graduate employability paradigm is limited and inadequate to support diverse students in understanding and navigating the super complex, uncertain and changing landscape of work (Barnett 2000) and technology (Peters 2017; LaGrandeur and Hughes 2017). The limitations of the current dominant human capital employability paradigm are linked to, as Evans (2019, this book) argues, such a paradigm falling short of enabling educators and students to understand

> the long-term crisis of capitalist concentration of wealth and power that leaves more and more people struggling to make ends meet (Hall and Klitgaard 2018: Chap. 7; Piketty 2014). It also falls short of addressing the crises of democracy and sustainability that call into question our purposes and responsibilities as human beings and culture makers. (Berry 1990; Madsbjerg 2017: Chap. 8)

The limitations are further linked to little, if any, consideration of personal life, the value of social networks, emotions and inter-connectedness (e.g. links to family

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and partner, personal mental health, bereavement, religion, sexuality), which can be for many, and women in particular, determining factors in employment decision-making (Finn 2017). The graduate employability paradigm proposed in this chapter is sensitive to the mentioned limitations of the dominant paradigm of skills and competences acquisition. I must say, however, that I am not sure whether the term 'graduate employability' itself might be obsolete and redundant in a critical dialogue, therefore in need to be jettisoned altogether. The term has gained a negative and unfavourable status in critical studies. Nevertheless, this does not mean that the present intention to expand the paradigm is not worthwhile and needed, on the contrary. 'Graduate employability' policy is the reality of Higher education institutions worldwide. It has been going strong in HE institutions, embedded in websites, promotional materials, brochures, performance statistic, extracurricular graduate employability schemes and 'enhancement' of the curriculum. As a person who leads an international professional doctoral module in higher education teaching, learning and assessment, I am fully aware that graduate employability policy agenda and initiatives have a strong presence across tertiary education globally. Therefore, it makes sense to use the term 'graduate employability' and build on the emergence of alternative views of graduate employability to open a dialogue about new perspectives on graduate employability, the future of work and graduate employment.

I propose a graduate employability paradigm shift that adopts an approach of 'three meta layers of relationality':

(1) Employability as relational recruitability: an approach that moves away from conventional realist and human capital discourse of individual skills and competences lists, towards alternative recruitability approaches that propose relational and negotiated affirmations and endorsement of individual graduate identities;
(2) Employability as socio-emotional relationality: an approach that expands the first layer to consider employment choices and decisions as related to the care for the closest personal networks (e.g. family), as well as humanistic care for local and global society; and
(3) Employability as eco-technological relationality: an approach that expands the second layer to consider employment choices and decisions as related to technology, local and global ecosystems.

To define what I mean by 'relationality', I'll refer to Finn's (2017: 421) definition: 'relationality' posits that actions, identities and values are fundamentally embedded within webs of relationships'. The relationality approach here can be related to Crossley's (2011) views of 'relational sociology', with the goal to bridge individualist and holist sociology, in this chapter focusing on human (humanistic) but also non-human (posthuman) interactions and relationality. The present meta-paradigm also incorporates Finn's (2017) relationality approach that builds on sociological studies of intimacy, personal life and emotions.

It is not to suggest that any proposed layer is good or bad or better than another, but to argue for a more encompassing and integrated approach to graduate employability, especially with regards to technology. The first layer is concerned with students' relationship with others and related practical actions and performances that would lead to graduate recruitment and career progress. Traditionally, the goal of getting recruited has been viewed via a conventional and mainly individual-focused approach of possessing skills, attributes and competencies, which is what Holmes (2013b) terms employability as a 'possessive' approach. In that way, recruitment is linked to possession and accumulation of some tangible skills or competences, 'disembedded' from graduates' intimate networks, personal life, emotions and mobilities (Finn 2017), as well as local and global socio-economic, political, technological and ecological landscape (Evans 2019, this book). The 'processual' relationality of graduate employability proposed by Holmes (2013b) is here perceived as a part of alternative relational approaches to *recruitability,* discussed later in the chapter.

The second layer positions graduates as inseparable, relational and reciprocal to the *humanistic care* for closest personal, local and global networks and society. It builds on the key ideas of reciprocity and emotional ties and responsibilities in (1) closest personal relationships (Finn 2017) and (2) wider local and global humanity (Eneau 2012; Peirce 2017/1923; Freire 1970/2005; Ryoo et al. 2009). This consideration of how individuals relate to closest and furthest social networks also include structural inequalities [the 'positional' approach to employability (Holmes 2013b)], detailed in the critique of 'skills and competences' approach in the next section.

The third layer expands the individual and social by emphasising that human identity and labour is not only relational to other humans but to wider ecological and technological development and challenges that human lives are embedded into (Evans 2019, this book; Peters 2017). Although this relationality is not explicit in many cases of advertised jobs, to consider questions of technological materiality and ecology of work is important for future sustainability of jobs and markets.

The three-layered paradigm challenges any bracketing and separation of individual, social, ecological and technological factors in education and graduate employability policy within higher education. The proposed meta-layers of the paradigm require an essentially dialogic approach (Jandrić 2017) to employability in pedagogy, led by students and teachers.[1] Such a dialogue tackles both practical questions of individual employment and the questions of structural privilege, class, race, ethnicity, gender and social networks formations as important employability factors, which are rarely overtly identified in the graduate employability paradigm and training rooted in human capital theory (Allen et al. 2012; Tholen 2013). This dialogue involves a critical engagement with graduate employability discourse and practice (Boden and Nedeva 2010), as well as the pressing challenges of our times for more sustainable technological and environmental futures (Evans 2019, this book; Danaher 2017).

[1]However, who would exactly do that ('graduate employability teaching') is a tricky issue. Policy documents apply the practice of 'nominalisation', which means that responsibility is defined vaguely and no concrete human professional is identified as responsible for some use or policy implementation or development (Peters et al. 2019). Therefore, the main issues remain around how and by whom this is supposed to be done and implemented.

In terms of my view on general policy feasibility, I adopt a view that all policies for educational development and futures, including all GE policies, are utopian to some extent. As Peters et al. (2019) comprehensively argue, *educationalisation* (the belief of solving structural and systemic socio-political and educational issues via educational policy and reforms, in a manner of more (of some) education for better results, the so-called 'edu fixes') and *technologisation* (turning to technology to enhance education in terms of its efficiency and effectiveness, the so-called 'techno fixes') represent neoliberal utopias. Utopianism exists within any educational vision for the future, be it the mentioned trends of technologisation and educationalisation or ideals such as Illich's (1973) de-schooling proposition (Peters et al. 2019). The problem is that only Illich's (1973) vision and a range of perspectives within the movements of critical pedagogy and social justice education are often perceived as utopian in the literature and by policy makers, including even the critical pedagogues and social justice proponents themselves (Peters et al. 2019). Most if not all educational policy suggestions and reforms involve an element of imagination apart from empirical evidence, especially in the case of policy borrowing (form different contexts). Therefore, all suggestions for educational futures involve subjective beliefs, imagination, myths and utopia. I acknowledge that this chapter is not only a conceptualisation but a suggestion for a potential policy paradigm shift, a kind of policy imagination. However, it can be a model for the development of graduate employability practice, inspiring and feeding into *existing* graduate employability initiatives and programmes, locally and globally.

Graduate Employability as Relational Recruitability

In this section, I provide an overview of graduate employability as a relational recruitability paradigm layer. The focus is placed on explaining why the 'skills and competences' approach in graduate employability is not enough, and why it needs to be related to fluid graduate identity, the others who endorse graduate identities, and contextual work demands. Although I am critical of 'skills and competences' as applied currently in dominant employability discourses and practices, I think that identity development can be related to particular skills. For example, 'touch typing' is a skill or ability that can be useful across a variety of jobs. For example, if I reflect on my context, the lack of this skill (or ability) makes an academic job of producing written outputs harder.

This first layer of the proposed graduate employability paradigm emphasises the action and performances that graduates need to do in relation to others (employers, university and social networks) *to be recruited and build foundations for career progress.* This orientation is present in a large body of graduate employability literature widely cited globally (e.g. Andrews and Higson 2010; Dacre Pool and Sewell 2007; Barrie 2004). These approaches adopt the human capital perspective of graduate employment, viewing it as something that is enhanced by the appropriation of a diverse set of skills and/or competencies and capability. Such focus on support-

ing student recruitability is reasonable, especially in the UK where education is not free and students pay high tuition fees and commonly take big loans for that purpose. However, questions are seldom asked about what the 'graduate employability' paradigm means, what local and global socio-emotional, economic, technological and ecological frames those policy and university efforts are situated within.

Human capital theory informs this dominant approach to the GE paradigm, foregrounding individual productivity (Garavan et al. 2001; Brown et al. 2003). As noted by Stanley and Mann (2014: 39), human capital 'can be denominated in terms of the competences or 'learning outcomes' of those emerging from educational and training processes, i.e. what they are able to contribute to the production of goods and services in employment (Cedefop 2009)'. In a thorough review of human capital theory as a graduate employability driving force, Tan (2014) criticises this approach because it sees the monetary value and productivity as the driving tenants of education. Translated into a university context, the 'human capital' approach requires market-driven 'excellence' (of the university, its staff and its students) and individual student preparedness for the market. Therefore, within conventional recruitability orientation, it seems that graduates need to be prepared to primarily serve the market and profits of their employers, with limited critical consideration of ties within their personal social networks and larger socio-economic, political, technological and ecological map that frame these market-led ambitions.

Holmes (2013b) provides a critique of and moves away from the 'skills and competences' approach to propose employability as a *process*, or processual approach, focusing on the *processes* graduates experience to adapt, negotiate and perform their developing and emergent *identity*. Within this novel conceptualisation, the identity is acknowledged as fluid, always in flux, and always relational as it is affirmed and disaffirmed by 'significant' others in students' lives. The focus remains on graduate recruitment, but in a distinctively new and relational way—via 'graduate identity' negotiations and performance endorsements by others (Holmes 2013b).

Essentially, there are major flaws with the orientation of 'employability as possession' of skills, competencies and attributes (Holmes 2013b). Many challenges with such an approach have been noted, such as:

(1) the assumption that there are discrete, existent, objectively real and (in principle) identifiable characteristics of graduates that constitute their identity and employability' (Holmes 2013a: 1044) and the difficulty of straightforward transfer of 'possessed' skills and attributes happening in university–work transitions and when contexts change in general (e.g. Oliveira 2015; Hinchliffe and Jolly 2011; Moore and Morton 2015; Holmes 2001),
(2) the overwhelming subjugation of higher education to the philosophy of capitalist and neoliberal economics, turning it into a consumer good and distinct market place (e.g. Frankham 2016; Komljenovic and Robertson 2016),
(3) the lack of recognising and exploration of a very diverse and complex social and identity capital networks, and positionality that students of different background and identity characteristics (e.g. class/race/age/ethnicity/gender/faith/sexuality/mental health) bring into tertiary education (Hinchliffe

and Jolly 2011; Furlong and Cartmel 2005; Moreau and Leathwood 2006; Speight et al. 2013),

(4) the prominent focus on individual skills and competences rather than intimate/close social networks, emotions and interdependencies (Finn 2017),

(5) the failure to relate employment to the wider context of global ecological and technological crisis and needs (Evans 2019, this book). For example, if information technology 'skills and competences' are important, students need to develop a capability for not just handling but comprehending technology and how it makes the world 'work').

With regards to the first challenge, there is little research done to explain how the exact 'skills and attributes' gained during Higher Education are transferred in an employment context and what that means for the employer and employee (e.g. Oliveira 2015; Hinchliffe and Jolly 2011; Moore and Morton 2015). It is useful to develop, for example, writing and communication skills in general terms. However, it seems unlikely that 'writing' or 'communication' skills can be taught in any straightforward contextually transferrable manner, since 'writing' and 'communication' skills and performance would need to be closely tailored for every job specification and context (Moore and Morton 2015).

The second challenge builds on the research about the changes of the structure and functioning of Higher Education institutions to resemble more the logic of education as a market place (e.g. Komljenovic and Robertson 2016; Frankham 2016), hence foregrounding the 'skills and competences' employability approach designed to meet the market needs. Universities increasingly function according to the rules of the market and promote the positioning of student as consumer (Komljenovic and Robertson 2016). Some commentators find that it might be the case of Higher Education institutions promoting and in that way 'imposing' graduate employability, skills and competences upon students, as many do not express any specific or overt attitude towards it, albeit some do (Komljenovic et al. 2018).

The third challenge links to the extensive research building on mainly sociological and critical theories tackling issues pertinent to social justice (e.g. Said 1989; Gajjala 2003; Sleeter and McLaren 1995; Hall 2001; Freire 1970/2005) and Bourdieu's concept of 'cultural reproduction' (Holmes 2013b). This body of research, concerned with social positionality and structuration, shows that progress of individuals in life, including employment and career, is highly dependent on the long history of socio-economic and socio-cultural inter-dependencies as well as expectations, codes, power relations, discourses, representations and structures. Critical research into structural inequalities in Higher Education in general (Waller et al. 2017) and linked to graduate employability (Tholen 2013; Tran and Soejatminah 2017; Boden and Nedeva 2010) sends alarming messages. It suggests that reproduction of prestigious top layer workforce happens among the individuals of more privileged backgrounds via their education, family, socio-cultural, linguistic, gender, race, ethnicity and economic belonging and networks. One example of privileged access to a better and more desirable post is the so-called 'old boy networks', e.g. in the UK. The online Cambridge university dictionary defines this phrase as: 'the way in which men who have

been to the same expensive school or university help each other to find good jobs', and 'the informal system in which men who went to the same school or university help each other to find good jobs or get other social advantages'. These aspects of employability hardly get considered and discussed with students within the skills and competences schemes. This is not to create some pessimistic sense of doom, 'council of despair' (Holmes 2013b: 548) and a sense of desirable career and social mobility impossibility, but to consider how students can be aware and empowered, for example by developing diverse social networks. Educators need to support the students in understanding the importance and dynamics of social networks, and jointly discuss and suggest ways of negotiating and building networks as well as alleviating social injustices.

Therefore, social mobility might appear more as a policy 'target' rather than an evidenced outcome. Simply 'equipping' someone with some skills and competences, might not necessarily mean a general but rather specific 'competitive advantage' (in particular environments, for particular jobs). If we take the UK as an example, Higher Education institutions are classified along the lines of prestigious (Oxbridge; the Russell group universities; research-intense universities; private universities) and less prestigious universities (e.g. post-1992 universities), this creates a two-tiered system (Boden and Nedeva 2010). It could be that elite universities educate students to be future managers, employers and leaders, members of advantageous societies and networks, while other universities educate a compliant labour force with the focus on employer-desired skills and competences (Boden and Nedeva 2010). Research into graduate employability has been ignoring these important issues of social justice (Tholen 2013). However, graduate routes into employment are even more complex and fuzzy than this 'advantage by socio-cultural and economic' positionality critique (Finn 2017). As Finn argues,

> women graduates, regardless of social class or resources, make sense of their post-university employment trajectories in and through their personal and emotional lives. What counts as 'success' for these women is often embedded in feelings of self-worth and gendered notions of making a difference or living a caring and connected life. (Finn 2017: 429)

The fourth challenge is thus linked to Finn's (2017) recognition that employment is closely linked to emotional negotiations of job decisions as relational to family, partners and peers, present for graduates of all socio-economic backgrounds (Finn 2017). The section on socio-emotional relationality that follows introduces the second layer of the proposed paradigm, further discussing and expanding the fourth challenge.

The fifth challenge aligns with the conceptualisation of the third layer of the proposed GE paradigm, GE as eco-technological relationality. Universities' GE policy might be failing to include the most recent debates around 'technological unemployment' (Peters 2017; Danaher 2017; LaGrandeur and Hughes 2017) and global ecological and sustainability crisis (Evans 2019, this book) in GE curriculum and teaching. Universities might have 'sustainability' (often optional) training or initiatives, which might be disconnected from graduate employability schemes and initiatives. The GE layer of recruitability needs to be expanded with more humanis-

tic approaches to relationships and interactions, before the paradigm moves on to the third layer of post-humanist and post-Anthropocene considerations of relationality with non-human entities (technology and environment).

Graduate Employability as Socio-emotional Relationality

Building on the challenges mentioned in the previous section, mainly the third and fourth challenge, the 'socio-emotional relationality' layer of graduate employability considers humanistic, emotions-based relationships, relational to graduates' closest social network (family, partners, peers), local community and the society and humanity at large. It emphasises the importance of social, cultural, emotional and spiritual values and fulfilment of a future employee via recognising the importance of 'reciprocity', interactions and inter-dependency in social relations.

Finn's (2017) 'emotional reflexivity' and 'emotional relationality' perspectives to graduate employability falls under this layer of the paradigm: the author is mostly concerned with graduate identity via intimate and personal networks, 'duty of care' feelings and interdependencies, arguing how they strongly affect graduate decision-making, and women in particular. Finn stresses that in spite of 'extra-curricular activities, which may be encouraged to produce a 'future-focused, performative self', many women may simply resist these in favour of more meaningful, care-centred strategies' (These strategies) 'might put them at a disadvantage whilst also increasing pressure on universities to attend to neoliberal notions of insert successful selfhood that fail to resonate' (Finn 2017: 429). She proposes 'proximate' and 'elastic' relationalities (Finn 2017). Proximate relationality considers graduates' decision as closely linked to their personal 'relational networks with a strong sense of mutuality' (Finn 2017: 421). Elastic relationality is the one where close networks and family members still have 'legitimacy and import, but not automatic priority' (Finn 2017: 424). Within 'elastic relationality', graduates make caring but more autonomous decisions.

The socio-emotional relationality paradigm layer here is not only considered in terms of close and intimate networks, but as a consideration of previously discussed structural inequalities and as developed in this section, humanistic attitude and care towards global society. I perceive close and intimate networks relationalities and mutuality as a more localised and micro contexts of a macro humanistic socio-emotional relationality and reciprocity. The idea of social value, 'reciprocity' and relationality is not something new. Philosophically, it is the staple of the humanistic philosophy of *Bildung*, a concept that was most prominent and some would say also most relevant to the period of Enlightenment and educational idealism in Germany (Winkler 2012). The concept of *Bildung* promotes the development of oneself holistically as a person and as a good citizen. However, *Bildung* is far more complex than that (see for example Schneider 2012; Winkler 2012). I acknowledge that attempting to propose its fitting into hierarchical and market-driven higher education institutional systems that actually stand in juxtaposition to the core meaning and value of Bildung (Winkler 2012) might turn into the hard labour of Sisyphus. However,

Bildung is here considered as a concept that informs the striving towards an ideal Higher Education, society and therefore ideal GE paradigm. It 'is the endless voyage of the individual towards him/her self as part of an ideal humanity' (Masschelein and Ricken 2003: 140 quoted by Peters et al. 2019: 243).

Such socio-emotional relationality aligns with citizenship education, as Evans (2019, this book) illustrates in her call for

> the participation of citizens who can effectively listen, empathize, envision, communicate, collaborate, and lead at the community level. Meaningful and widespread participation in collective life fosters the development of leadership skills and the recognition of self-efficacy required to sustain participation for the long haul. This work is human work that must be finely attuned to social and cultural contexts.

Socio-emotional relationality should afford students and educators to discuss the human condition at a deeply personal (Finn 2017) and at a larger social and humanistic level. 'Reciprocity' in socio-emotional relations is one of the key aspects of being a human, deeply anthropological, both ancient and modern, relating to the fields of religion, law, economics and morality, in short the exploration of human nature (Eneau 2012). According to the Ancient Greeks, altruism that calls for reciprocity means and develops 'a general love of humanity' (Eneau 2012). Reciprocity is therefore closely related to two classical ideas of love—*philia* and *agápē*. *Philía* is the strong connection that exists between close friends, partners and family. *Agápē* goes further as a relationship that transcends interpersonal, elevating the interpersonal to the love of and love for all human beings and beyond, including all other existing species (Eneau 2012; Peirce 2017/1923, 2016; Freire 1970/2005; Olteanu 2015). *Agápē* is a general, unprofitable care for human and other beings. *Philia* and *agápē* are intrinsically linked and they can develop within intimate personal networks and as relational to general humanity. These concepts counterbalance the neoliberal focus on individual success and needs in the dominant graduate employability paradigm. *Philia* and *agápē* mean

> the selfless drive to arrive at a personal exchange and supposes the desire for true happiness, both for oneself and for others (…) To live well, with and for others, is the only ethic that we should impose upon ourselves. (Eneau 2012: 39)

Therefore, this layer of social relationality challenges individualist preoccupations, such as pushing oneself to obtaining power over and retribution of others, to achieve success and competitive advantage. Such preoccupation with individual success can support actions that are 'petty, unfulfilling, and destructive for individuals and, indeed, whole cultures. We are born for (…) more harmonious and sustainable lives. We are born to care, to engage in 'Project Love' (Volf 2010: xxi)'.

Socio-emotional relationality, humanistic care, *philia* and *agápē* are not an easy pairing with 'employability' since employability is a contested and controversial term, even rejected by some, and viewed by many academics as an extra burden in relation to the curriculum and teaching (Speight et al. 2013). However, Higher Education across disciplines needs to start tackling questions of 'the human condition' in general, and at university and work in particular. This might be more important than ever when local and global society is experiencing a mental health

crisis (Parsfield 2013), and an epidemic of loneliness (King 2018), both having grave effects on human health and life span. Students' mental health struggles (Kadison and DiGeronimo 2004) could be considered as the product of a number of issues related to their identity development and relationships with close networks, living under pressure and stress shaped by students concerns with individualist performance targets, success measurements, and future employment competition. As mentioned above, in light of these pressures, many graduates make employment decisions based on their 'feelings of well-being, stability and personal satisfaction' (Finn 2017: 428). The meaning of employment success then expands from monetary and production values to emotional values and well-being. These views and cases need to be acknowledged as a part of important and legitimate graduate employability trajectories.

In the context of work, socio-emotional relationality could mean to practice 'companionate love', the values and 'feelings of affection, compassion, caring, and tenderness for others—at work' (Barsade and O'Neill 2014). Such feelings and positive emotional cultures are important for the well-being and satisfaction of employees. The lack of loving (as opposed to predatory, indulgent, utilitarian and competitive) relationships at work contributes to emotional exhaustion by employees (Barsade and O'Neill 2014) as well as moral, intellectual and emotional crisis, which can lead to or be the product of negative perceptions of the workplace. The questions of relationality and well-being are further expanded in the third layer of the GE paradigm.

Graduate Employability as Eco-technological Relationality

Having centred on the human aspect so far, the paradigm now moves to its third, 'post-human' layer. In this chapter, post-humanism is used to mean 'decentring the human by its imbrication in technical ecological/biological, and informatics networks' (adapted from Wolfe 2010: xv). Contemporary literature is abundant with debates on 'post-human' struggles: global ecological challenges (Evans 2019, this book) and 'technological unemployment' (Peters 2017; Danaher 2017; Neisser 1942). The concept of 'technological unemployment' suggests that the progress of technology is linked to the rise of human unemployment, as machines increasingly replace human work, and at a faster pace than it is possible to develop new jobs and find substitute work for displaced employees. The concept can be also perceived as the 'job crisis'. This crisis is relevant to the spread of technologies at work and for work optimisation, which are mostly non-negotiable for the workforce affected. Simply put, new jobs do not outnumber the jobs made obsolete (Evans 2019, this book). It is important to discuss these changes with students, not just in relation to automation, but in light of the power of technological data harvesting to serve the building of super-intelligent AI systems and for other purposes, as led by global power house businesses and high-tech corporations, governments' institutions and military organisations. Although all the wonderful, entertaining, life-changing and life-saving sides of technology need to be duly acknowledged, an acknowledgment

of the unsettling life-changing technological effects (such as the loss of jobs) paints a fuller picture of the relationship between humans and technology in the context of employment. In essence, this relationship is both beautiful and unsightly. Here more space is given to the focus on the 'unsightly', as the beautiful is already embraced at a massive scale, both entertaining and distracting us all.

The debates surrounding 'technological unemployment' are not something new, as Neisser (1942) discussed it in the 1940s and Woirol (1996) explored the issue in the 1990s, among many others. The issue is as old as the technology itself and when the techno era started in human history is debatable, but some origins of the debate could be traced back to Aristotle, or even the invention of the wheel. There is certainly enough literature for GE programmes to build on and incorporate the concept of 'technological unemployment' in the GE curriculum and teaching methods. Educators and education can, therefore, open the door to contested debates surrounding work, including the ones that challenge the very focus on work in the society, such as the ideas by Kathi Weeks and other authors that propose the concept of 'post-work' (Weeks 2011). The arguments of post-work seek to radically change our perception of what counts as work and what work is, in relation to for example, unpaid and taken for granted work, overwork, underwork and non-work.

Unless the GE paradigm incorporates student–teacher dialogue about the abovementioned issues and debates towards future action and change, universities will be increasingly out of step when it comes to responding to global technological challenges. Educators could introduce and discuss a variety of articles and edited books that explain the risk, contestations and instabilities pertinent to the future of work and technology. This includes possible practical responses to automation, technological futures scenarios, and unemployment, without succumbing to technological anxiety and paranoia. For example, Danaher's (2017) article 'Will life be worth living in a world without work? Technological unemployment and the meaning of life' unpacks various aspects of technological unemployment, the contested character of the debate, and possible ways forward. *Surviving the Machine Age: Intelligent Technology and the Transformation of Human Work* edited by LaGrandeur and Hughes (2017) offers a range of chapters that consider how technology is transforming work. Relevant work can be found in many books, articles and empirical work, some that might stand in opposition to each other and their? present book. For a good debate to thrive, opposing views are welcome. Such a debate would foreground the questions of who uses the technology, how, and with what intentions, as well as what technology does, how it affects global social and ecological habitus, and what it means for human, post-human and post-digital labour and development.

With many technological challenges, what are some of the possible new ways of employment for graduates? Digital social entrepreneurship (DSE) could be considered for example as an area of graduate employability programmes, which foregrounds the use of technology for employability. Many employers perceive the trait of being 'entrepreneurial' as too risky as it does not directly serve employers; hence it could be viewed as not that desirable a 'trait' in graduates (Sewell and Dacre Pool 2010). However, supporting graduates to consider founding personal and collective digital businesses that tackle social and ecological challenges in the world today might be one of many possible options to attempt addressing technological

unemployment and ecological crisis. This means that the new graduate employability paradigm would consider creating new ways of working and creating digitally. This is probably happening to some extent at some institutions. I am aware that some programmes support students to create their own start-ups both to serve local community needs and take ownership of their careers. Albeit an attractive concept for supporting the society via technology, DSE is not without caveats. Some of them mean that one has to be well-prepared to work independently, the risk might not 'pay off', and balancing business and social goals is not an easy task (Masiero 2011). Masiero proposes an approach to balance business goals and social goals, which often clash in the context of DSE (Masiero 2018). She proposes to first deploy a set of digital capabilities aimed at reaching financial sustainability in the long term. Then combine these with field immersion capabilities, which are instrumental in maintaining the embeddedness of organisations in their local communities. In that way, as Masiero emphasises, 'the digitally-enabled could contribute to tackling poverty and vulnerability on a world scale'.

The topic of digital economy and digital social entrepreneurship in the GE curriculum would be well expanded by incorporating a dialogue about 'digital collaborative networks'. This dialogue means to consider humans and therefore graduates as digital *homo collaborans* (Peters and Jandrić 2019), that is, human labourers who work and support each other via digital networks, governed by the logic of collaboration and peer production (Losh 2016). Collaborative networks support an individual's sense of belonging. As the sense of 'belonging' is important for human and student well-being and academic success (Strayhorn 2012), the creation of supportive digital networks is one logical possibility for a fulfilling future of work. Certainly one may question the nature of the networks and what they aim to produce, be it material goods, services, or knowledge. In this chapter such networks are envisioned as networks that aim to improve the lives of diverse humanity and all things without focusing on exclusive groups. It involves a system of interdependent webs of life, matter and ideas, including cyborgs and speculative sentient beings.

Alongside the challenges posed by automation, the ecological crisis is very real, linked to technological advancement, and needs urgent attention by policy makers and the designers of employability curricula and policies. In her chapter, Evans (2019, this book) refers to key ecological and sustainability challenges: anthropogenic climate change, widespread pollution in water and land including the creatures in these ecosystems, overexploitation of agricultural lands soil depletion, overfishing, mining and depletion of non-renewable resources, intensification of social inequity and oppression that further widens the globally imbalanced distribution of the employed and unemployed. Ecological consequences of plastic and toxic waste are rather troublesome. Therefore, supporting students to link their employment choices to ecological challenges of our times could inspire many to work towards and be the change that the planet and all of us need; for example via 'local and global production' trails and maps activities, as suggested in the next section.

To round up the techno and ecological challenges discussed so far, I'll finish this section by turning to the great Polish science fiction author Stanislaw Lem. His work can be a great well of inspiration for educational dialogue and debate about

the future of work. Lem was able to stretch his imagination beyond the commonly imaginable to tell fascinating stories about techno-social utopias and dystopias. In Lem's book *The Futurological Congress*, the main character Ijon Tichy finds that the world around him is a lie, an illusion. It has been revealed to him that people are being consistently under the effect of psycho-chemical drugs that induce a permanent state of hallucination in order to see the world for what it is not. It is an idea of an entire world living in the state of high-tech virtual reality. The 'real' reality involves robots maintaining order and some humans are convinced that they are those robots. I refer to an extract from 'The Futurological Congress' provided on Ken Sanes' website 'Transparency'.[2] I perceive this part of science fiction as a dialogue trigger, a wake up call not to be seduced by 'pretty pictures', (on the internet, entertainment and social media) that, albeit satisfying, indispensable, and much loved, mask unpleasant truths and draw our attention away from the reality we should engage with.

> 'We keep this civilization narcotized, for otherwise it could not endure itself. That is why its sleep must not be disturbed…' Symington tells Tichy.
>
> 'The year is 2098…with 69 billion inhabitants legally registered and approximately another 26 billion in hiding. The average annual temperature has fallen four degrees. In fifteen or twenty years there will be glaciers here. We have no way of averting or halting their advance – we can only keep them secret.'
>
> 'I always thought there would be ice in hell,'… Tichy responds. 'And so you paint the gates with pretty pictures?'

Rethinking and Reimagining the Paradigm

The reimaging of the GE paradigm that I suggest in this chapter integrates triadic *relationalities: relations with others for individual recruitment, relations to others as humanistic care for the closest and widest society, and the relationality to the ecosystem and technology*. What this means for education and HE is to cultivate dialogic pedagogies that will support graduates as a collaboration-minded, socio, ecologically and technologically aware and relational beings. The following Fig. 13.1 builds on the three mentioned layers of the reimagined GE paradigm.

What Might This Mean in Educational Practice?

Activities for Dialogic Pedagogy that Applies the Relational Employability Paradigm

Via a balanced and critical dialogue about employability, educators can be agents of change in higher education (Rudd 2013), and inspire students to be and act as

[2] http://www.transparencynow.com/introlem2.htm.

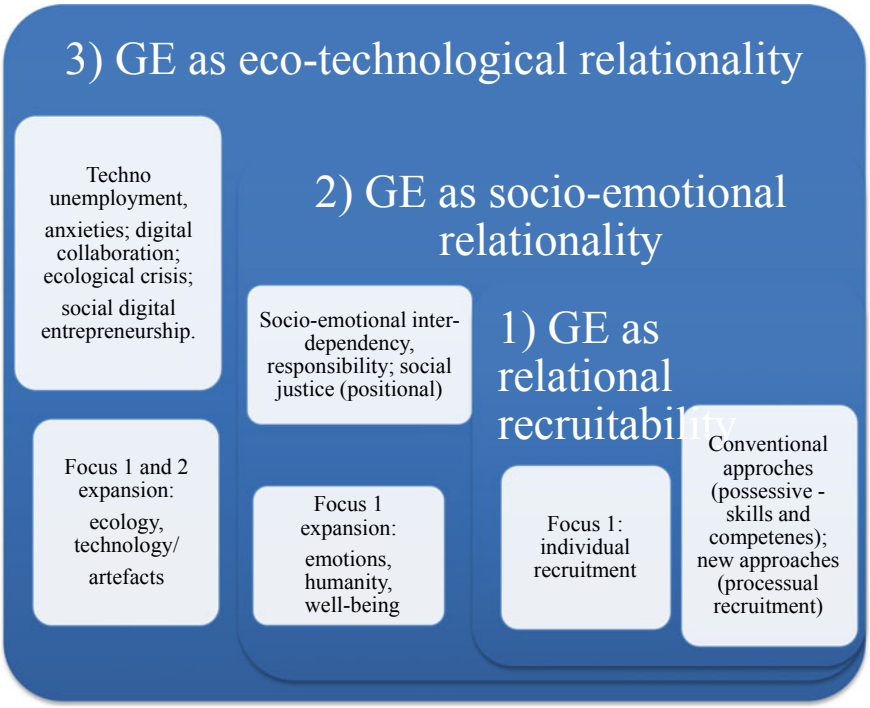

Fig. 13.1 Graduate employability (GE) paradigm shift: an integrated relational three-layered graduate employability model for teacher–students employability dialogic pedagogy; it incorporates Holmes' (2013b) proposition of possessive, positional and processual approaches to graduate employability

agents of change themselves (Evans 2019, this book). Case-based GE education can be developed to engage students in developing portfolio-type cases that build on their experiences (related to the curriculum, extracurricular activities, work placement, any other training or experience). I have provided some examples of literature for teacher–student–peer dialogue on technological challenges and unemployment within the discussion of the third layer. Excerpts and summaries from science fiction books or example of digital collaborative networks as well as DSE could be reflexive triggers for dialogical exchange and student GE project work. Further possible activities include students creating and sharing their own 'personal, local and global networks and relationality' maps. These 'maps' could start from close social networks and expand into local, national and global contexts, focusing on the jobs students would want to obtain upon graduation. Students would consider various interdependencies and complexities of their lives, so that they create maps of possibilities and reflect on possible routes, challenges and factors that will inform their decision-making and employment opportunities. These maps would range from the skills and competencies, to personal networks' interdependency and global social and

technological landscapes. As it is expected, that there will be varied levels of sensitivity related to personal circumstances and experiences, some information might need to be revealed only confidentially to trained teaching staff.

Students could research, design and create 'global production chain' trails and maps to explore personal, local and wider interconnectedness. Recently, Knowles explored the global trail of flip-flop production,[3] the world's number one best-selling footwear. This trail shows often unsettling routes, interconnectedness and conditions of global flip-flop production, the role of technology, the problem of toxic and plastic waste, and struggles of the peoples spread across the globe, all related to that chain, mostly oblivious to each other's existence and inter-connectedness. Everyone owning a pair of flip-flops, including myself, is a part of the relational labour chain of people, machines and nature connected to global flip-flop production. Some people in that chain live at the verge of sustenance. Some other people invent ways to make a change. Kenyan artist Francis Mutua[4] and his crew recycled 500,000 flip-flops in 2017 by collecting them from the shores of the Indian Ocean and creating beautiful sculptures. Therefore, students could investigate global production trails within GE programmes and/or with regards to issues in their disciplines (language, chemical composition, waste, moral and social impact, inequality, trade, fair trade, biosphere, human health and diseases, pollution and so on, connected to any discipline). This could ignite the spark in them to be the agents of change in our world (Kay et al. 2010). Students could explore various products related to their envisaged and desired jobs, discuss what that means in terms of their closest personal and wider global interdependency, social justice and technological unemployment.

Educators can thus start raising awareness among students, colleagues and managers, which can lead to a renewed way of conceptualising work, and subsequently a new approach to teaching about future employment and employability. To perceive work in the ways contemplated here calls for a graduate employability curriculum and pedagogy that is highly interdisciplinary (Evans 2019, this book). Such a development requires experts across disciplines coming together in order to contribute with perspectives and questions that can inform employability development, activities and cases that students can engage with.

[3] http://www.flipfloptrail.com/.

[4] http://theincidentaltourist.com/kenyan-conservation-group-ocean-sole-is-turning-flip-flop-pollution-into-art/.

I would exercise caution that the ideas proposed here should not serve an extra burdening of academic staff, without any feasible and negotiated plan for implementation. This is a delicate issue. It would take one more chapter or article to get deeper into the questions of: who is responsible for the implementation of the graduate employability policy and paradigm, to what extent, why this responsibility should be (or not) taken by universities, academic teachers or dedicated staff, and how exactly this is to be done.

This triadic paradigm mix is not a panacea for accelerated automation and data-harvesting issues that affect technological unemployment and education. Its weaknesses can be also seen in incorporating a wide range of approaches and therefore lacking focus. However, a meta conceptualisation and meta-paradigm serves the purposes of bringing concepts together and this is done under the three aspects of 'relationality'. I have provided arguments why this is needed and sketched some ideas of how this could be implemented in pedagogical practice. The next step is to develop this paradigm model into practice and evaluate it.

Conclusion

Graduate employability policy is the reality of global Higher Education, as Higher Education policy bodies and institutions are strongly promoting and implementing graduate employability policy initiatives and its link to the curriculum (e.g. HEA 2013). If GE policy continues spreading in Higher Education globally, the GE paradigm needs to include and go beyond individual recruitment, to consider individual, social, technological and ecological interactions, inter-connectedness and justice, technological (un)employment and other issues and debates about contemporary human labour and its future. As educators, we can support students' work on sustainable and collaborative social and techno-futures, reducing employability neither to society-as-a-whole nor to individuals.

In this chapter, I have argued why the single individualistic, market and competition driven paradigm of skills and competences is not adequate and not enough. I have proposed an integrated paradigm of three 'relationality' layers, and a schematic paradigm model/figure of the paradigm that GE initiatives and policy can build on. The proposed GE paradigm that considers employment as relational to technology might help avoid any dystopian technological futures unravelling, such as the Black Mirror's world in the episode 'Metalhead' (Season 4). The episode shows some post-apocalyptic world controlled by autonomous and invincible killer-technology, possibly the consequence of disastrous military techno-experimentation. Seemingly, that is a distant, overly dystopian and unlikely future shown in a disturbing, fictional world of a TV series. Yet, this unsettling vision builds on imagining possible futures. It might be that most valuable insights can be gained when utopia and dystopia meet, within a dialogue in flux between ideal and worst-case relational scenarios for graduate employment futures. As technology progresses at an unprecedented speed, students need to be supported to understand and relate their employment not only

to personal goals and aspirations, but to the society and ecology in immediate surroundings, locally and globally, and our increasingly intelligent and indispensable machines.

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Chapter 14
Care Amidst and Beyond Technological Unemployment

Murray Robertson

A Reminder of Care

At a time when technological change and economic recession herald a decisive shift in how we all relate to work and value, it can be easy to overlook those aspects of work not (yet) made obsolete. Care—broadly defined—is one such area of work which defies full automation, remaining stubbornly material. When discussing how technological unemployment is affecting education, it is worth considering how care operates within the educational sphere. Educational theory and care have a long history together. Dewey's (2011) democratic classroom might well be described as a classroom where care is ever-present (Monchinski 2010: 85–90). More explicitly, Freire (1996) has much to say on the reciprocal caring relationship between teacher and student. The Freirean account of dialogic, mutual respect that lies behind any 'true education' (Freire 1996: 74) mirrors greatly the care ethics discussed below (Noddings 1984). Monchinski (2010) goes so far as to argue that if Freirean critical pedagogy is not a form of care ethics itself, then it is the best route to realising proper care within schools. Without diminishing these important accounts of what might be called eudaimonic care—care that aims to bring the most out of the carer and cared for—I want to point towards an aspect of care not wholly explored by these writers: the labour that is spent doing care in the classroom.

Care work—both to sustain life and to improve it—is ever-present in education. Amidst a crisis of care provision, educational workers are expected to do more with less under increased scrutiny, to work for longer hours, and to get more done in those hours than ever before. Crucially, they have also become the front line in supplying (unpaid) care in all forms to the communities they work amongst: from emotional support to lunch money, counselling to heating costs (Tickle 2014). Educational workers are taking on much of the load of an eroding social democratic welfare

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system and the beginnings of technological unemployment. Meanwhile, key debates involving technological change and its effect on the shape of work—productive versus unproductive labour; the intersections between social reproduction, emotional labour and surplus value; the feminisation of the workforce (Weeks 2007; Fraser 2016)—are material realities within our schools, colleges, and universities.

While emergent conditions raise a possibility of mass technological unemployment, I want to caution against too hasty a generalisation of what this means for our working lives. Care labour's irreducible presence in workplaces presents problems both for 'entrepreneurs', who see technological unemployment as a boon to value creation, as well as those who see an opportunity for progressive technological fixes (Hardt and Negri 2001; Mason 2015). Any worthwhile account of work in a period of potential mass technological unemployment must reckon with the un-automatable care work which reproduces us and our social form.

Maintaining this cautionary tone, care labour as it currently operates is not something to aspire to in post-capitalist imaginaries. Care work should neither be lumped in with other forms of work that may soon be overtaken by new technology nor held up as a vision of technologically engaged, unalienated work. Instead, it should strike at the forefront of thinking about how work is currently composed and how it might be. The private emotional management present in waged and unwaged care work is shaped by capital and is thus a poor model for unalienated work. In due course, I will examine two strands of care theory—liberal feminist care ethics (Noddings 1984; Tronto 1993) and social reproduction theory (Dalla Costa 1972; Fortunati 1995)—to construct a fuller political account of care. If we grasp the labour involved in care—thinking again before idolising emotionally charged, vocational care work—we can better understand the composition of work in schools and beyond that characterises so much of modern value creation. Alongside this, a fuller understanding of the political subject of the carer is a necessary precondition for organising care in ways that do not merely align with contemporary forms of work.

Throughout this chapter, I maintain that care, broadly defined, is one of the most important political and philosophical concepts available to us. We are cared for, care about, and care for others in a variety of forms from birth unto death and often beyond. Any move towards a flourishing life, I believe, needs to tackle care and the work that sustains it head-on. Any serious political project must confront the evolving crisis of care provision, recognise the work that is involved in care and who is doing this work, and give an account of how care will be delivered under its political rubric. Care work at present is gendered, feminised, farmed out to migrant workers, and often underpaid or entirely unpaid. It is also vital and not going away. Any account of work—positive, negative, antiwork, or automated—that does not address care as a primary component is useless. Any account of care that does not address work is just as useless.

Care is an admittedly ambiguous term. I suggest that it is most ordinarily used in two senses with reference to humans: to care *for* and to care *about*. Among others, I take some part in the care of, am cared for by, and care deeply about my partner, family, friends, neighbours and comrades. I take care of and care about my cats, my home, the potted plants outside my front door, the local area and the

wider environment without receiving what might be called conscious care in return, though all contribute to my well-being. These acts of taking care are different from one another in straightforward ways. However, it is not obvious what element of care is common between all of them beyond the fact they involve relationships to others. Writing on care is similarly varied. From ancient Roman myths of the god Cura to psychosocial theories of development, Christian theology involving caring for souls to Kierkegaard's notion of the concerned thinker, notions of caring for and about ourselves, our ideals and others abound. As caring, even a minimal self-regard, is an ever-present reality of human existence, this should come as no surprise. The term is so broadly used that a full treatment of its history is outside the scope of this chapter. However, some of the most ancient extant literary accounts of care reflect the dilemma I wish to tease out in caring: Virgil writes of care as a burden that drags us down, personified in the Cares that haunt the underworld's entrance, while Seneca describes care as a rewarding human capacity for devotion that is matched only by the gods (Reich 2003). This duality of care—as a burden and as an uplifting devotion—is as good a shorthand as any for the politicised discussions of care amidst technological unemployment I wish to advance.

Why Care About Care?

The sheer volume of care needed just in the UK is staggering. Billions of hours are spent caring for others each year. After decades of state underfunding and parliamentary ignorance of the issue, the shortfall of care provision is truly frightening.

With government focus since the 2008 crash squarely aimed at reducing state expenditure, care provision has suffered. Local government, the focus of much state-funded care, saw its spending in England cut by a fifth between 2009–10 and 2014–15; a real-time funding loss of £18bn, with £9.5bn more set to be removed by 2020 (Gainsbury and Neville 2015). Importantly, less than £2bn of the funding cuts have come at the expense of the administration and bureaucracy of local government; social care services have borne the brunt. Shrinking expenditure has been accompanied by a conceptual shift in government from a duty to provide services to a duty to 'prevent peoples' needs escalating unnecessarily' (Social Care Institute for Excellence 2014). The heralded replacement of state-run care services with private or charitable care provision has simply not materialised. Private care providers are dangerously understaffed, underfunded, with one in every 20 care jobs available vacant (Boffey 2015; Rhodes 2017).

Unsurprisingly, this crisis of care has hit children and parents hard. All in all, one in five children in the UK with at least one working parent is growing up in poverty (Carr et al. 2014). Caring costs on families push an extra 130,000 into the official measure of child poverty, while the risk of falling into poverty increases by a third for children whose working parents pay for childcare (Hirsch and Valadez 2015). Statutory measures put in place to assist with care costs are broken: Although the Childcare Act 2006 requires English and Welsh local authorities to provide sufficient

childcare for working parents, less than half of all English councils could meet this requirement in 2016 (Rutter 2016).

The lack of socialised care is felt in education, where teachers and other school staff regularly attempt to pick up the slack. One in three teachers in England and Wales bring food io feed children who haven't eaten anything in the morning, with financial struggles at home being the main reason given for pupils going without breakfast (Kellogg's 2016). This lack of nutritious food in the morning is compounded by strict eligibility rules for free hot school meals in the middle of the day: an estimated 1.5 million children living in poverty do not receive free school meals even though their parents earn below the national income eligibility level of £16,190. 'All working tax credit recipients are automatically excluded from claiming free school meals even if their income is below eligibility' (Forsey 2014: 49–50). With good indications that a healthy breakfast can improve educational outcomes (Littlecot and Moore 2015) and hungry children's behaviour having a big impact on the time teachers can dedicate to educating (Kellogg's 2016), it is little wonder that school staff dip into their own pocket to provide food. Beyond providing meals for children whose parents cannot afford to feed them, school staff are giving money for transport and paying bills, donating furniture and clothes, and regularly acting as frontline social workers, keeping an eye out for the warning signs of families in financial, physical or mental distress (Tickle 2014).

Post-Marxism, Post-capitalism, Post-materiality?

Despite a great deal of tough labour expended caring for children, it is tempting when looking around at computerised workplaces and the proliferation of Internet-related technologies to declare that we are amidst a new kind of economy. Many influential post-Marxist thinkers have followed this line, arguing that we live in a capitalist system, where value creation is radically altered compared to the industrial production of the prior hundred or so years (Lazzarato 1996; Hardt and Negri 2001). This loose school of thought argues that a new form of labour built around affectivity and creativity characterises our economic system. Capitalism, according to this schema, has 'abruptly realigned its economic priorities in favor of the intellectual component in formerly manual work' (Brennan 2003: 343–344).

This *immaterial labour* is different, it is argued, to material productive labour insofar that it 'produces the informational and cultural content of the commodity' (Lazzarato 1996: 133). Moreover, the new mode of production that accompanies immaterial labour makes a new kind of 'intellectual worker' (Lazzarato 1996: 140) and allows for a 'form of cooperative interactivity through linguistic, communicational, and affective networks' (Hardt and Negri 2001: 294). As such, Marxist conceptions of labour, value, and exploitation must be rewritten or abandoned. Change in the world will come, it is asserted, not from class conflict or revolutionary political organisations but via the new intellectual worker's 'strategy of refusal' (Tronti 2007) to participate in the capitalist social form. Some formations of post-Marxism go so

far as contending that immaterial labour could be the building block of an economic system that transcends capitalism (McClanahan 2013: 85–86; Mason 2015).

The claims of a radically new economy appear bold on inspection. As Timothy Brennan has forcefully argued (Brennan 2003), we would have to ignore a vast amount of human labour undertaken daily around the globe to agree that immaterial labour has superseded manual work. From the copper and cobalt miners hewing out the raw materials of computerised lives, to decidedly unautomated factory workers constructing circuit boards and batteries, it is hard to swallow the argument that we live in a 'post-material' world. This is not to say that the global economy has stood still since the 20th century, nor to ignore those workers in creative and affective industries. It is simply to resist the post-Marxist insistence that the partial deindustrialisation of the US and European national economies represents an entirely new mode of production (McClanahan 2013: 85).

Post-Marxist writers who view immaterial labour as a precursor to unalienated creative work echo the 'essentialist ontology' (Weeks 2007: 243) in romantic notions of pre-industrial craftsmanship, articulated in the utopian writing of Morris (2008). Morris views the handcrafted object as distinct from and better than the mass-manufactured items of the industrial process because handicraft labour supposedly produces goods that emphasise use value. Though not devoid of alienating influence, handicraft production is said to be less estranging, with a meaningful connection between creator and creation, and is held up as a good model of concrete labour (Weeks 2011: 85–87). What this nostalgia does, however, is dress up a specifically historical account of labour as an essential, positive quality of the relationship between humans and work. The model of work embedded in capitalist society is here mistaken as a 'transhistorical capacity for labor' (Weeks 2011: 89) bedded to human nature. A similar romanticism can be seen emerging in the discussion of immaterial labour. Morris' utopia of wholly unautomated, handcrafted beauty gives way to fully automated, immaterial expression; both guilty of ready celebration of the inherent nobility of creative work.

A tendency to raise up certain forms of labour as unalienated or noble in some way can also be found in David Graeber's recent account (2018) of 'bullshit jobs'. Rather than arguing along with post-Marxists that the work we do is less material than of old, Graeber instead suggests that increasingly more of us regard our works as meaningless or bullshit. Much of our labour, he argues, is unproductive 'make-work' (Graeber 2018: 62) and—worse—we do not believe it contributes a to a meaningful change in the world. For many of us, our working days are spent in the mire of ennui. On the back of this description, Graeber argues (at the least) for a general reduction in work and a reorientation towards 'socially valuable' (Graeber 2018: 128) jobs that meaningfully and collectively change our lives for the better. All the socially valuable jobs described are said to involve caring in some form or another. Moreover, Graeber insists that all non-bullshit jobs involve caring to a degree, at least in the sense of caring about the social value of one's working life. (Graeber 2018: 147–151)

Although I agree that much of modern work can be well described as lacking social value, and though a stress on the importance of care labour is welcomed, Graeber's picture of care is rose-tinted. He emphasises the side of care that is relational, loving

and 'life lived properly' (Graeber 2018: 149) without fully engaging in the work of care that needs to happen for these sorts of fulfilling aspects of care to come to the fore. Virgil's gripes are ignored for Seneca's joys. Though care work might not be bullshit, much if it is disgusting and pure drudgery. Importantly, this other side of care does not exist solely because society is orientated against valuing it. Care work can be and should be organised, socialised and remunerated far better than it is currently. Yet the day-to-day necessities of caring for others—even and perhaps especially those we love—are unavoidably messy and understandably miserable to some extent. The grubby materiality of care does not sit in stark contrast to productive labour—care companies turn a profit after all—and nor can it foreseeably escape its grubbiness. I raise this not in a defeatist manner but as a call to see care in its dual nature: as important yet grinding. We must not romanticise care. Instead, it should be properly accounted for as part of a demand for communally organising care in as equitable and liberatory a manner as possible.

In much of the above, I am critiquing two ideological drivers of labour under capitalism reproduced as radical, anti-capitalist positions. First, the necessity of maximising exchange value-creating labour cast as the idea of noble work being an important part of human nature. Second, the capitalist work ethic repurposed as a necessary—at times celebrated—part of any post-capitalist society (Weeks 2011: 89–90). This confusion of a standpoint critical of capitalism from inside capital as one outside of it is, as Weeks convincingly argues, is a confusion of Marx's critical analysis of capital with a plan for a non-capitalist society. Marx's detailed examination of labour—his labelling of the categories of exchange and use value, concrete and abstract labour—are not provided as ways out of capitalism, but simply descriptions of how capital operates.

Though many people's working lives have drastically changed in the last few decades, the composition of productive labour has not shifted to the purely intellectual. Moreover, though technological unemployment is undoubtedly a pressing issue, it is not the case that all forms of labour are being made redundant through technology. 'Pure, bloodless information work is much rarer than the discourse of the immaterial might imply', and even that work 'depends on highly embodied, deeply material, and emotional modes of exploitation' (Power 2015). I wish here to stress caution at the pronouncements about the changing nature of work. When we discuss modern work, we cannot lose sight of the vast amounts of material labour that is performed. We need, particularly, to pay attention to the labour of care. This is as true within the sphere of education as anywhere else.

Any analysis of the work happening in schools and how technology is changing it must address the material implications of care labour: the emotional burnout that teachers face, the crowding out of emotional interaction between pupils and teachers, and other negative factors common to reproductive labour. A refusal to abstract care from material contexts enables the subjects of care to be properly contextualised and humanised. Appropriately structured political realities can allow for and foster the exercise of good care, and one of the key social structures of care is the labour expended to perform it. Care work needs to be understood and accounted for to fully

contextualise the morality of care and, further, to move towards political structures that foster *good* care, within the classroom and without.

With this focus on care as work, I argue we can talk about the emotionally charged labour of care in education while avoiding the somewhat patronising claim that work which has a great emotional investment—such as teaching—is less alienating or should be a model for work generally.

Care Ethics

How might we better think about care, then, in a way which is sensitive to the material realities of care and its role in modern work? I put forward two accounts of care—liberal feminist care ethics and social reproduction theory—that I believe capture important aspects of care, before outlining a synthesis of the two accounts.

Care ethics is a broad church of thought which aims to centre ethics on the relationship between carer and cared for, constructing better social relations because of this centring. Care ethics sees care as an active, relational experience with another person, 'the range of human experiences which have to do with feeling concern or, and taking charge of, the well-being of others' (Graham 1983: 13). This range of experiences take up a great deal of our lives and, as those who espouse care ethics see it, to discuss morality or justice without discussing care is to shut out an important aspect of human experience. As Joan Tronto puts it,

> our account of moral life should provide us with a way to respect and deal justly with others. To do so, we must honor what most people spend their lives doing: caring for themselves, for others, and for the world. (Tronto 1993: x)

Nel Noddings can be thought of as the originator of care ethics as a distinct moral theory (Noddings 1984) Her account of care ethics begins from several essentialist positions. Echoing 1970s feminist psychological theory, she states that women have a propensity to tackle moral dilemmas in a different manner to men. Instead of attempting to solve moral problems via reasoning and with regard to principles or duty, Noddings maintains women begin to solve such problems by being attentive to the material realities of the problem and to themselves as persons able and willing to care. (Noddings 1984: 26-29) Further, she argues that humans have a natural drive to care, or at least to be sympathetic to the plight of others, particularly that of children, and a willingness to maintain caring moments. Beyond this natural drive to care, Noddings wishes to set an 'ethical ideal' (Noddings 1984: 81) of caring, simultaneously self- and other-regarding, to remain in caring relation to others. This ethical ideal is nurtured through dialogue and practice, engaging with others and assisting them in fulfilling their needs, achieving their goals, and willingly engaging in the ethical ideal themselves. It is maintained through attention to the successful fulfilment of itself, the celebration of living a good life in an ethically difficult world (Noddings 1984: 120–131).

The caring relationship, along with the acts of care within it, is seen by care ethics not only as important in itself but important too in fostering relational understanding, empathy, and attention to the other as an ethical practice (Kittay 2011: 81). This focus on relationality echoes both Freirean and Deweyan pedagogy, advocating for meaningful and equitable relationships between individuals as the basis of good political and educational communities (Freire 1996; Dewey 2011). By cultivating the sentiments that arise in good care, while being mindful of our dependency on others' care for us, it is hoped by Noddings et al. that a body of ethics will be formed that acts as a corrective to the impersonality of Rawlsian theories of justice which dominate Anglo ethical discourse. The ethical machismo of autonomy and defence of rights that such Rawlsian approaches emphasise is to be tempered by a reflection on dependent and caring relationships. Interaction with liberal theories of justice has moved care ethics in its more recent forms to advance a democratic theory, which posits the caring relationship as a corrective to undemocratic political practice. This contemporary formulation argues for the reorganisation of society according to a public ethic of care, albeit in a familiar liberal democratic model (Tronto 1993).

What is striking about Noddings's account is that almost all her examples of caring revolve around mothering. Though she does discuss the care of an ill relation, her paradigm of care is the relationship between a mother and child. Relations of power, delegation, and autonomy differ in the myriad of caring relationships we have with one another. It should be clear in this regard that the relationship between a parent and a child is not the same as the relationship between two lovers caring for one another, nor the same as a parent caring for their physically disabled adult child, nor the same as a professional care worker caring for one of their charges and so on. The focus on mothering as a paradigm for care opens care ethics to accusations of essentialism, both in terms of care as a biological capacity and in terms of the sort of women that have this capacity to care. In the former case, it is important to distinguish the accounts of care ethics such as Noddings's which describe care as inherently feminine or motherly from later accounts which point to the gendered roles in society which cultivate a self-fulfilling reality of women as those who care along with gendered conceptions of moral virtues. Those care ethics that adhere to Noddings's account appear to hold to the view that caring is a womanly trait, regardless of the social structure humans find themselves in. Sarah Hoagland, though challenging the idea of caring or mothering as the way to understand moral agency in women, points out that this earlier writing on care ethics was a reaction to the masculine ethics and decidedly white, male subjects at the heart (then, and now) of philosophical debate (Hoagland 1991: 246–247). Though I reject the notion of a caring as a naturally female capacity, I am sympathetic to Noddings's countering a dominant, masculine ethics of independence with ethics of dependence. However, in the demand for a 'woman's voice' to be heard, it is important to question *which* women are listened to (Lugones and Spelman 1983; Lorde 1984). Noddings's account, which draws heavily on her personal experience of motherhood, runs the danger of universalising a particular experience to that of all mothers and all women. Narratives such as this exclude accounts of motherhood that are not white, first world, or bourgeois. This exclusion 'obscure[s] the significance of other aspects of women's identities, such as

race, class, and sexual orientation, and marginalize the experiences and the voices' (DiQuinzo 1993: 1) of women whose identities do not match Noddings's own.

Rejecting such an unsatisfying account of natural moral formation and identity does not necessitate rejecting gendered moral reasoning altogether if we accept that gender is socially constructed. Traditional gender roles incorporate moral norms and dictate 'proper' moral behaviour for respective genders. As Marilyn Friedman suggests, we can point to a division of moral labour (Friedman 1987: 94) regarding moral roles in areas such as the family, state, and economy. Men typically enjoy control of the power of public institutions, of governance and control while the private—the relational—has been seen as the domain of women. These gendered inequalities go together with clearly defined moral projects: male-gendered moral norms are structured around justice and rights, while attentiveness and care are melded with female-gendered moral norms. This division of moral labour not only primes people to accept and propagate their assigned gender role, it acts as a stumbling block for those who wish to operate in a space where the moral norms are different to those which they have been steeped in (Friedman 1987: 93–96). Male-dominated professions and activities are imbued with male moral norms, further cementing the notion that only those who display the virtues associated with men are suitable in that field. Hence Anglo philosophy's 'lopsided obsession […] with universal and impartial conceptions of justice and rights and the relative disregard of particular, interpersonal relationships based on partiality and affective ties' (Friedman 1987: 92).

Social Reproduction Theory

The material implications of care have also been examined by a differing—yet, I argue—complimentary account: from Marxist feminist theorists of the 1970s (Dalla Costa 1972; Fortunati 1995; Federici 2012). It is their understanding of work *beyond* waged labour that is most pertinent to our present discussion. Focusing on Marx's discussion of how the working class is reproduced, the realisation quickly follows that a great deal of work necessary to capitalism is conducted outwith what normally would be considered the workplace. The wages for housework campaign—started in 1972 by feminist Marxists such as Mariarosa Dalla Costa, Selma James, and Silvia Federici—laid bare the ignored labour of care. The campaign's provocative demand for wages paid for domestic labour was a hard-fought cause, but was also used as a platform for the women of the campaign to challenge contemporary understandings of work. Their lived experience as unpaid reproductive workers in conflict with capital in the home, at school, and in the wider community refocused Marxist theory towards the challenge to capitalist accumulation away from the shop floor, 'recogniz[ing] the materiality of life and of the works that safeguard it' (Dalla Costa 2012: 227).

The two strains of thought above are not, of course, completely independent, although much of the literature discussing either one of these traditions neglects the other. This is perhaps not surprising, given on the one hand care ethics' grounding

in the analytic framework of liberal democracy and on the other Marxist feminists' unapologetically critical stance. Broadly, care ethics is concerned politically with outlining the deficiencies in the experience of carers in liberal democratic society, putting forward (at times, far-reaching) institutional reforms to bring out care and its labour from the margins of society. Marxist feminists, on the other hand, see an examination of care and care work as part of a broader investigation of social reproduction intended to better understand capitalism with the intention of overcoming it.

Despite these generalised differences, the terrain of care has produced intriguing convergent evolution of thought from both accounts. It would be deeply unfair to say that care ethicists are not concerned with the liberation of care workers; equally unfair to say that Marxist feminists do not bother engaging with the psychological and moral aspects of care. Liberalism focuses on the interpersonal in part because it eschews looking at the structural. In this, liberal theorists can at times have more fine-grained insight into the interpersonal than radical theorists would care to admit. However, the lack of focus on the structural means liberalism's discussion of the interpersonal falls short of the full picture. Rather than wanting to simply recognise the work carers do—falling back to something like the view of work as self-empowerment held by liberal and socialist feminists—I want to problematise the work of care. In this way, I am looking to move away from a thin, bureaucratic account of the political possibilities of carers within liberal democracy towards a space for a politics of care.

Returning to the two distinctive yet compelling accounts of care, we might say that these two accounts are at odds. I want to say instead that they have complimentary aspects. Workerist ideas of care labour dispel much of the essentialism of care ethics, and better problematise the labour that is an irreducible part of care. Care ethics champions those aspects of care that are genuinely important to building a better world, while taking seriously the subject of the carer. Care has a dual capacity for being burdensome and—at the same time—a template for the sort of attentive relationships which can produce the most rewarding examples of human community. Virgil and Seneca are finally in dialogue.

Care's Possibilities

So where does this leave us with an understanding of care? How do we advance a conception of care that does not gloss over the burden of caring while acknowledging the important relationships that care forms? How do we pay proper attention to the commodified, gendered, racialised and globalised parts of care labour, while not dismissing the changing nature of work in a world of technological unemployment?

One steppingstone towards such an understanding of care is Nancy Fraser's work (2016). Fraser puts forward an account that is couched in terms of social reproduction but which also reflects the relationality that care ethics spotlights. She argues that the crisis of care is a result of capitalist social relations, in its current form a financialised capitalism that is increasingly inhibiting social reproduction. Our ability to properly

care for one another is adversely affected by the structure of the society we inhabit. The crisis of social reproduction is that,

> without it there could be no culture, no economy, no political organization. No society that systematically undermines social reproduction can endure for long. Today, however, a new form of capitalist society is doing just that. The result is a major crisis, not simply of care, but of social reproduction in this broader sense. (Fraser 2016: 99)

The capitalist economy depends upon social reproduction as one of its 'background conditions of possibility' (Fraser 2016: 101), just as it depends upon state enforcement and an environment capable of supplying the raw materials of production. Fraser's focus is here on the care which not only sustains but socialises us, allowing capitalist social relations to persist and the economy to function:

> [Care] forms capitalism's human subjects, sustaining them as embodied natural beings, while also constituting them as social beings, forming their *habitus* and the cultural ethos in which they move. (Fraser 2016: 102)

Further to Fraser, I suggest that an ethic of care is not unsalvageable and can reflect the above if we move away from an individualised understanding of care. A non-individualised understanding of care 'does not depend on one but rather on many and is thus inseparable from the social, material, and concrete forms of organization of the tasks related to care' (Precarias 2006: 40). This would be a communal care ethic.

Precarias a la Deriva, a feminist collective in Madrid, gives voice to such a politicised and radical ethic of care. They present four core elements to a progressive understanding of care: First, *affective virtuosity*. This is a dismissal of the notion that care only happens out of love. Instead, care is to be understood as an 'ethical element' (Precarias 2006: 40) that is integral to all (good) relations between people. Echoing traditional care ethic's emphasis on the relational, affective virtuosity refers to the intangible creativity required for intersubjective, empathetic moments. Our ability to create meaningful relationships relies on this affective skill. Secondly, *interdependence*. Caring is required by all in some shape; we depend on one another to provide it. Further, we are not fixed in a position of care. Our caring relations shift throughout our lives, despite labour relations attempting to fix us in static, racialised and gendered forms of care. Third, *transversality*. Rather than trying to find the hard edge of what is and isn't care based on remuneration, affect or moral appropriateness, care is here understood as having multiple dimensions. Care exists both waged and unwaged, rewarded or not. The nitty-gritty of care work shows its material aspect, yet the relational aspect of care is deeply affective. Care is commodified yet operates also outside the productive sphere. We 'cannot clearly delimit lifetime from work time, because the labor of care is precisely to manufacture life' (Precarias 2006: 41). Fourth, *everydayness*. Even though it varies in its deployment, organisation, and refinement, care is integral to the continuation of life and thus is ever-present. Bringing the everyday nature of care out of the shadows is key; any forward-thinking political project cannot overlook care (Precarias 2006: 39–42).

The above goes some way in articulating the radical potential of a relational notion of care. With this framework, we avoid crude positioning of caring that links it to

specific aspects of Western motherhood without giving up the notion that a caring relationship can be rewarding and transformative. We acknowledge that even the most rewarding caring relationship involves work, and as such it is susceptible to propping up capitalist accumulation. At the same time, we reject the idea that simply because caring relationships are important, the labour involved is of a different, unalienated kind to other work. So too, we can talk about the affective aspect of care without diminishing its material forms. And we allow for the relational parts of care to be as destructive and exploitative as the labour it entails. We allow care to be thought of in terms of piss, shit, and laundry alongside transformative love. Importantly, we forefront care as a political project in the home, the classroom, and the polis, centering it in existing and sought-after social relations. In doing so, we can approach the important task of critically reacting to current and imminent technological unemployment without eliding the materiality of care.

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Part III
Education in a Workless Society

Chapter 15
A Wantless, Workless World: How the Origins of the University Can Inform Its Future

Nathan Schneider

Faculty Meetings

It is common practice in academic settings for professors to complain about their faculty meetings. A stew of lingering interpersonal conflicts, externally imposed constraints, and the inadequate procedure can lend such gatherings a sense of futility; they can seem singularly discouraging. Yet faculty meetings are also a singularly democratic form of management in an economy that more often seeks to govern workplaces by fiat or algorithm. These meetings are living remnants of a pre-industrial corporate form, the self-governing medieval guild, which modern universities have adapted into a still irreplaceable mechanism for education and research. Perhaps the scorned faculty meeting deserves more credit.

Discussion about the future of higher education tends to focus on how universities might better conform to present and predicted market dynamics (e.g., Etzkowitz et al. 2000). Less common are considerations of historical patterns that have proved remarkably resilient, which might serve as the basis of the next reinvention—patterns embedded in such commonplace activities as faculty meetings. If it is true that the economies of labor and education are due for a drastic, technology-induced realignment, such patterns can be useful reminders of what the university is for, apart from the utilitarian exigencies it has come to serve in our own fleeting contexts.

This essay considers higher education not through the lenses of pedagogy or philosophy, but as a domain of institutional design. I approach these institutions less in legal or managerial terms than as elemental media (Peters 2015) that shape the social and economic environment—as media, what affordances do these institutions offer and what do they inhibit? What signals does their presence transmit?

I will first review how early institutions of higher education arose, in three different societies, as a set of strategies to protect and encourage knowledge-production

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practices that I describe as *productive leisure*: self-directed time organized to meet collectively agreed-upon standards. These practices, which the surrounding social and economic order might not otherwise have seen fit to value, have transformed their surroundings, and they have become vital fixtures of sophisticated civilizations. Practices of productive leisure have also become targets for colonial regimes seeking to undermine such civilizations for their own ends.

Today, an existential threat to the social order as we know it comes in the form of technological disruption, automation, and the business models that organize them. I suggest that platform cooperatives (Scholz and Schneider 2016), combining networked technology and democratic governance, are a promising strategy for protecting productive leisure. But this is not a merely defensive posture. Such cooperative higher education can also serve as a means of ensuring that the benefits of the transformation underway circulate to a broader set of people and purposes than is currently the case. In particular, by protecting productive leisure through higher education, economic upheavals can yield widespread dividends of liberated time.

Such higher education can help people meet their immediate needs while also transforming the order in which they live. It can reverse trends of instrumentalism and colonization. As it has before, higher education can lead social transitions, rather than merely adapting to them. This is a strategy for the present founded on patterns of the past.

Early Universities as Institutional Adaptations

The apparent etymology of the word *university* has tempted commentators to wax poetic about the institution's transcendent purpose. Newman (1905: ix) opened his *Idea of a University* by defining it as 'a place of *teaching* universal *knowledge*'; the weightiest word there, *universal*, he deemed so obvious as to be unworthy of emphasis. Hutchins (1969: 2) understood his 'university of utopia' in the context of the New World urge to 'universal education' available to all. Neither interpretation of the English word's Latin source, *universitas*, is historically instructive. At the time that word was first used for institutions of higher education, it referred to a particular form of association in Roman law, whose name literally meant something like 'the whole of you' (Rashdall 1895: 7). The same term was used for craft guilds and other kinds of corporations. It meant 'universal' only to the degree that it described a legal unity among some plurality of persons engaged in a common enterprise. Before the university stood for an aspiration to universal knowledge or universal access, it was a particular kind of company. This legal sense of the word is all the more significant since the university that was perhaps Europe's first, that of Bologna, was principally a school of law. As a recent authority on the matter states, 'There was nothing special in the word *universitas*' (Pedersen 1997: 145).

Yet those lofty aspirations toward which Newman and Hutchins point have a place. Whenever civilizations have given birth to university-like institutions, it has been to protect fragile and precious pursuits. Ephemeral schools of higher education

have come and gone around the world for millennia, but the formation of lasting, formal structures represent civilization-making turning points.

In China, by the fourth century BCE, the imperial state saw fit to establish institutions that could serve thousands of scholars at a time, granting them license and resources to pursue wisdom through Confucian texts and ritual expertise. According to Lee (2000: 2), 'Confucian teaching is centered on personal enrichment rather than on its usefulness for securing recognition or benefit to one's self'. More obviously practical pursuits naturally competed for attention and investment; the structure that most secured a place for the Confucian scholarly ideal, by the medieval Tang and Song dynasties, was the civil-service exam, which enshrined the mastery of certain classical texts as a prerequisite for government employment (Hayhoe 1989). This worldly technique made more transcendent pursuits, and the universities that supported them, viable as a way of life.

As the Chinese exam system matured, a different kind of higher education began to take hold in Islamic Africa. Small madrasas attached to mosques grew into larger centers of learning such as Al Qaraouyine in Fez, founded in 859 by a wealthy woman from the Tunisian holy city Kairouan. It would attract the region's most eminent scholars, including the historian Ibn Khaldun and the Jewish philosopher Maimonides. Whereas the Chinese system depended on political patronage, the early African universities relied on a feature of Islamic law, the *waqf*, a sacrosanct trust that preserves endowments of property for charitable and religious purposes (Lulat 2005). Within that legal and economic fortress, years of study in religious and philosophical matters became tenable; someone might remain a student at an institution like Cairo's Al Azhar for a lifetime. North Africa became the capital of higher learning for the whole Mediterranean region.

A notable difference between these indigenous institutions and the universities that were later formed under colonial rule in Africa and Asia is the commitment to knowledge not oriented around immediate instrumental value. The *waqf* and the civil-service exams enabled and protected those seeking such knowledge, serving as membranes between the scholars and the socioeconomic surround. When colonial regimes arrived, they saw fit to abolish both systems, supplanting them with instrumental facsimiles of the European university model. 'The pursuit of knowledge for its own sake,' according to one history of African universities, was 'jettisoned in favor of an exclusively utilitarian view of higher learning' (Lulat 2005: 3; see also Hayhoe 1989). But the universities that Europeans installed as colonists were not the kinds of universities they developed for themselves at home.

The European universities had precedents in less formal schools that had existed for centuries, usually attached to rural monasteries, urban cathedrals, or the ad hoc followings of popular intellectuals. But the *universitas* as such, as a more or less autonomous institution, arose through nearly simultaneous developments in Bologna and Paris, mainly in the trailing decades of the twelfth century. Today, as precarity appears to be an ascendant tendency of the social contracts we tolerate (Standing 2011), the context from which the early universities arose may strike us as familiar. Both cities had become centers of learning for scholars from abroad who lacked citizenship in the local political order (Pedersen 1997; Rashdall 1895). Such a gathering

place became known as a *studium generale*; the *universitas* was the form of legal association that helped secure and direct the *studium*'s activities.

In the case of Bologna, the outsiders were the students, who came to experience the distinct mixture of Roman and Germanic legal traditions in which Bolognese scholars specialized. Although typically wealthy, these students lacked essential political rights and local knowledge in Bologna, so they formed associations to strengthen their hand in negotiating on matters such as housing costs, tuition, and due process. With support from the Holy Roman Emperor, their corporations gained legitimacy. This system was, and would remain for centuries, the prototype *student* university, a self-managed association of students that hired teachers and negotiated collectively with the economy around them. They threatened boycotts of their teachers and the city if their demands were not met. As a canonical English-language history of European higher education puts it, 'The very existence of the University was due to the want of political status on the part of its members' (Rashdall 1895: 160). There was no fixed campus; part of the university's strength was the threat that it could move the economic benefits of its presence elsewhere.

The late twelfth-century situation in Paris was a kind of mirror image of Bologna. Rather than a law school catering to adult, well-heeled students, Paris was chiefly an ecclesial school that specialized in theology. The students were younger—generally what we would now call teenagers—and more variable in the economic background; both they and the faculty had often traveled from abroad for clerical careers, sharing only Latin as the common language and clustering in what came to be known as the city's Latin Quarter. The university that had formed to oversee this arrangement was a guild of professors, as they were the constituency best suited to wield leverage against municipal authorities in Paris. While in Bologna the outside ally of the university was the Holy Roman emperor, in Paris it was the pope.

In Paris, too, scholars were vulnerable, and not entirely holy. A signal moment in the university's founding, in the year 1200, was a tavern brawl over terms of payment that resulted in the deaths of several students. The resulting settlement placed university affiliates under ecclesial rather than civil jurisdiction.

Both the Bolognese and Parisian models were replicated elsewhere, but Paris was far more so. (A university of faculty also formed in Bologna, although it didn't achieve dominance over the students until the eighteenth century.) Both organized as a self-governing guild of members, backed by external authority, to ensure that apparently abstract and unmarketable undertakings had a place. Without such work, modern science, philosophy and industry are unimaginable.

This is the legacy we have to thank for our faculty meetings, along with various regalia and titles. Like the Chinese exam and the Islamic *waqf*, the institutional adaptation that turned a guild into a university-created space for the birth of the next civilization in the midst of a civilization that might not otherwise see the worth of what was to come. 'The genius of the Middle Age showed itself above all in the creation of institutions,' according to Radshall (1895: 709). And to what end were these institutions created? The answer seems deceptively obvious: 'To make possible the life of study' (1895: 714).

In this light, we might consider another etymological curiosity—that the word *school* derives from *scholē*, the Greek word for leisure.

Productivity and Productive Leisure

The university, among the civilizations surveyed, has been a ploy that renders a set of activities not obviously useful to the surrounding society into something legible and even valuable. In particular, universities have specialized in protecting time. They organize and baptize, for students, the investment of several years of non-remunerative activity in early adulthood; for career scholars, the system makes possible greater investments in expertise and research. All these investments tend to pay off, for both individuals and their societies. But in order to make such investments, the university is a necessary trick—a form of elemental media that contrives to represent the value of activities whose worth may not otherwise be evident.

Well before the rise of European universities, guilds were organizations for mutual protection. The earliest guilds were at least in part mutual-defense pacts, promising vengeance should harm come to any member, in addition to collectivizing the costs of fraternization and funerals (Epstein 1991); later, they evolved more abstract forms of protection, such as securing the investment costs of training a young craftsperson and protecting incentives for inventors in lieu of a patent system (Epstein 1998). The universities adapted guild mechanisms to protect the congress of transnational scholars in certain jurisdictions and to protect their time together.

More specifically, I refer to what universities specialize in protecting as productive leisure. It is productive because it seeks the alchemical promise of generating interpretations and innovations that would not otherwise be available. Yet this process remains leisure because it is significantly free from the demand to extract 'deliverables' of immediate value to the outside world (Butler 2014). University members decide individually and collectively what they value, and they adopt structures and disciplines to organize their efforts. Typically, the most accomplished scholars enjoy the fullest license to pursue matters of the least obvious economic value—whether they be inquiries into the origins of the universe or ruminations on the life of the mind.

Universities have been almost uniquely successful at liberating time. Ever-larger proportions of the human population, through the university gambit, justify devoting years of their lives to study. This achievement has been surpassed perhaps only by the reductions in working hours achieved through labor unions.

The liberation of time has been a long-promised but little-delivered feature of modern social contracts. Generation after generation expects advances in technology to result in increased quantities of leisure. Hunnicutt (2013) provides the definitive overview of this history in the US context. Far from the Weberian caricature of a 'Calvinist ethic' of overwork, the eminent colonial-era Congregationalist theologian Jonathan Edwards took for granted that 'contrivances and inventions' would 'expedite' people's 'necessary secular business', leaving 'more time for more noble

exercise' (Hunnicutt 2013: 15; see also Schneider 2014). He, together with influential preachers who followed him after independence, hoped that such freed-up time would be used for pious activities. Edwards was not a natural educator—he died shortly after reluctantly assuming the presidency of what is now Princeton University—but in the twentieth century it was educators who took up the subject of leisure where he and the other preachers left off (Gershon 2014). In his 1912 address to the Modern Language Association as chairman, Frank Gaylord Hubbard (1912) reminded his colleagues of the leisure for study that attracted so many of them to the teaching profession in the first place, and he called for a revival of 'a true revival of learning' in society, which would mean ensuring 'more leisure for education and more education for leisure' (Hubbard 1912: lxxix–xc). He assumed that a 6-hour standard workday was already attainable. A decade later, Chicago-area English school teacher Althea A. Payne (1921) worried about the ascendant movement for a 42-hour workweek and challenged her profession, 'It is our duty as educators to equip the boys and girls in our care with interests and ideals that shall urge them to use this leisure profitably' (Payne 1921: 209). On the eve of the Great Depression, the eminent economist John Maynard Keynes predicted that his grandchildren would have to learn to live with a workweek of just 15 hours (Keynes 1930/2010); during the postwar economic boom, the former University of Chicago president Robert Hutchins (1969) expected universal joblessness by the turn of the millennium and envisioned the liberal arts as a means for training people to put their expanding leisure time to proper use.

'We are going to live in a wantless, workless world,' he predicted. 'The machines will do the work' (Hutchins 1969: vii)—and the university would have to prepare people for everything else.

Today, visible especially through the growing interest in universal basic income, expectations of near-future leisure (or else cataclysmic unemployment) are experiencing a revival (e.g., Brynjolfsson and McAfee 2016; Van Parijs and Vanderborght 2017). That is one side of the 'free time' legacy that Hunnicutt chronicles—the expectation that such time would come inevitably, like a thief in the night. But the lived reality of obtaining free time has been much more a contest of value-capture through struggle.

During the late twentieth and early twenty-first centuries, the often militant labor movements on both sides of the Atlantic regarded a reduction in working hours as a chief demand—'not just bread, but roses, too,' as the reformer Rose Schneiderman and others preached (Brooks 1912). First for a 10-hour cap, and then eight, workers undertook a decades-long effort that was both deadly (as in the Chicago Haymarket riots celebrated worldwide on May Day) and successful. Yet after the enshrinement of an 8-hour standard, the struggle for time fell dormant. Economic productivity per worker-hour has continued to increase, but working hours, as well as wages, have held relatively steady (Aguiar and Hurst 2007; Michel 2012). Ever more people have lost access to stable hours and wages altogether (Standing 2011).

Among the most lucid thinkers on leisure and labor struggles, especially in the context of greater automation and service work, is André Gorz. Unlike many of his contemporaries, he didn't expect rising productivity to translate automatically into ubiquitous leisure. Rather, he regarded leisure as a choice—one that could not be

made within the confines of 'economic reason' alone; institutions accountable not chiefly to market outcomes would be necessary to accumulate leverage necessary to choose and demand it. 'History may place the opportunity for greater freedom within our grasp,' he wrote, 'but it cannot release us from the need to seize this opportunity for ourselves and derive benefit from it' (Gorz 2011: 185). Toward the end of his life, in the early 2000s, Gorz came to see knowledge work, and the university in particular, as a strategic site for such grasping (Poltermann 2014).

Without struggle and institutional change, the promised dividend of leisure does not appear to manifest on its own. Rather, the dividend appears to be concentrated in the form of profits to capital-holders (Alvaredo et al. 2013). Meanwhile, proposals for the future of higher education have tended toward a posture of market adaptation, either by imitating the idiom of the entrepreneurial class (Etzkowitz et al. 2000) or instituting 'vocational'[1] retraining programs for displaced workers (Selingo 2018). These strategies fall far short, however, of the sort of role that higher education has played in its origin stories—establishing and protecting the value of activities not otherwise valued by the outside society, so successfully as to transform that society and what it values.

To recognize higher education as a champion of productive leisure is to reclaim that former role, short of mere nostalgic recapitulation. The university can be a means—not the only one, but an essential one—of finally obtaining the due dividend from widespread productivity and realizing a society in which full-time employment is less necessary for more people than it is today. As in earlier times, this is a transformative project in which the university, if effectively constituted, can exert decisive leverage. The university of utopia that Hutchins envisioned might not be so distant.

Higher Education as *Productive*

Even if the premodern institutions of higher education defied the usual determinants of value around them, they were nevertheless built on a presumption that they would be productive. The Chinese system bore the Confucian premise that textual and ritual study would produce more effective administrators for the imperial state. The Islamic universities grew from a legal and theological paradigm of autonomous charitable trusts, and their students produced professions from religious law to medicine, in which philosophers like Ibn Rushd and Maimonides would frequently find employment. The fact that the European universities would borrow their legal grammar from the craft guilds was no aberration; whether they were faculty or students, members of a university saw themselves as engaged in pursuits as worthy of self-organization and recognition as any profession.

The most direct descendant of the guild in the industrial era and beyond is the cooperative. Cooperatives employ roughly 10% of the global labor force in enter-

[1] I use scare quotes because the now-commonplace usage (pertaining to mere jobs) is a near total reversal of the word's classical meaning (pertaining to a person's higher calling).

prises ranging from credit unions to farming, manufacturing, and retail (International Co-operative Alliance n.d.-b). More than the charitable corporations that tend to house leading universities, this is a corporate form designed to harness productive activities, capturing and distributing surplus value to those who participate in generating it. Unlike private, for-profit universities, cooperatives prevent the capture of that value by outside investors. Co-ops played a considerable minority role in forming the industrial world, and the model has aroused growing interest and experimentation among people confronting the challenges of post-industrial, networked economies (Conaty et al. 2018; Schneider 2018b). This contribution, however, has been widely disregarded in business and economics education (Schneider 2016). For societies increasingly organized over online platforms, the framework known as platform cooperativism (Schneider 2018a; Scholz and Schneider 2016) is especially relevant. Conceiving of the university as a platform allows for the embrace of diverse media as its points of connection, from transnational campuses to MOOCs; insisting on cooperativism means ensuring that the value of those connections are democratically shared and governed.

Neary and Winn (2009) proposed a theoretical and pedagogical intervention of recognizing the 'student as producer' in higher education. This was based on a fuller appreciation of unacknowledged production that students already undertake, as well as the promise of an educational experience in which participatory research supplants the posture of 'student as consumer'. Subsequent proposals (e.g., Winn 2015; Neary and Winn 2017) reimagine the university as a worker-owned cooperative among its constituent contributors, from students and faculty to service workers. Given the decline in public investment in higher education, coupled with the abuses of for-profit alternatives, the cooperative represents a uniquely appropriate middle ground.

Neary and Winn (2017) argue that the form known as the 'social cooperative' holds particular promise. This model first appeared in Italy, starting in the 1970s, as a vehicle for the provision of state-funded medical and care services (Thomas 2004). Whereas co-ops have conventionally been organized around one stakeholder class—that is, workers or customers or businesses—social co-ops tend to be multi-stakeholder, integrating into their ownership and governance a more diverse set of participants. For instance, a home-care co-op might include members who are employee caregivers as well as patients, their family members, and local organizations engaged in public health advocacy. In Italy and elsewhere, this model has proved effective in delivering high-quality, low-cost services, paid for both by government funds and private clients.

A university is an intrinsically multi-stakeholder institution, and modern universities typically include a variety of organized factions, from faculties to residential colleges, from student governments to service-worker unions. A university could collect all these groups into one multi-stakeholder cooperative, or else operate as a collection of single-stakeholder cooperatives acting in tandem.

In their multi-stakeholder structure, universities are more akin to platform enterprises, which create value by facilitating connections among users (Parker et al. 2016), than to industrial production and distribution. Their productivity thus lies principally in the free exchange they enable. The governance of such exchange is a

complex, delicate task, which cooperative structures can facilitate through the trust-building capacity of shared ownership (Hansmann 1996).

What keeps cooperative governance accountable is the entity's capacity for capturing, holding, and collectivizing wealth on behalf of its members. Like both social cooperatives and universities today, the wealth might come from market transactions, philanthropy, and taxation-based public support. But rather than regarding students as merely clients and faculty as merely job-holders, the university would be accountable to them as owners. Such ownership can encompass various roles; students might receive stipends to support their productive leisure, which might be paid for with stock dividends from future employers or startups. Tuition might be expected for purely professional degrees. While the outcomes of research should be openly accessible, the university can be more aggressive in claiming an equity stake in any market commercialization.

An instructive method for networked value creation through leisure is that of 'peer production,' employed especially by free/libre/open-source software (FLOSS) communities, such as those that support the GNU/Linux operating system and the WordPress blogging platform (Coleman 2013). While this paradigm has been remarkable in harnessing widespread, free-will contributions for productive ends, its production has generally remained available for corporate value-capture, such as Alphabet's use of the Linux kernel in its surveillance-oriented Android mobile operating system. But such outcomes need not result from FLOSS-like production. Dmytri Kleiner (2010), for instance, proposed a 'Peer Production License', which would preserve content for free circulation and utilization by nonprofits and cooperatives while requiring separate license agreements in cases of for-profit commercialization. This and similar interventions can be used to ensure both the free exchange of ideas and value retention by universities and their members.

Over the course of their lives, members might opt to move back and forth between employment in the market and the university—perhaps for a few years at a time, or perhaps for part of every week. People might switch universities as their needs change, and they might rotate among teaching, learning, and research. These roles could be fulfilled on campus or off. Thus, the university becomes less a fixed set of prescribed early-adulthood experiences and more a platform for lifelong productive leisure.

Such an arrangement need not require entirely new institutions; just as medieval universities grew from the *waqf* and the guild, the next universities can emerge by building on and amplifying latent tendencies. For instance, Deep Springs College in California and Berea College in Kentucky already provide free education for all students, coupled with a universal expectation for productive employment. Extractive student loan programs could be replaced with wealth-building mechanisms like a leveraged employee stock-ownership trust (Hockett 2007; Kelso and Kelso 1986). Existing alumni networks would be all the more robust if they were bound with co-ownership and the promise of lifelong participation.

Many university communities already benefit from co-op student housing and co-op student jobs; some have organizations, like the University of Massachusetts Amherst's Cooperative Enterprise Collaborative, that promote such enterprises.

California's community colleges, while developing a strategy for introducing their students to the gig economy, passed over large investor-owned gig-work platforms in order to collaborate with Loconomics, a cooperative platform in which workers become co-owners (Schneider 2018b: 153–154).

These tendencies can be expanded in strategic fashion—through cooperative research centers, cooperative teaching programs, leveraged trusts, lifelong membership, and more—to turn the university from a consumer-service model back toward its origins, toward the purpose of liberating time for productive leisure. In medieval Europe, universities enabled rights-poor foreigners to gain due process and collective bargaining, so their education could be allowed to transform the society around them; today, universities can be a vehicle for finally translating our societies' collective productivity into a dividend of self-directed time.

Higher Education as *Leisure*

The most widely discussed proposal associated with liberating time today is universal basic income (UBI)—an unconditional, regular cash payout to all citizens of a given jurisdiction. This proposal, while not new, has attracted renewed interest in recent years from advocates as diverse as feminist Marxists (Weeks 2011), right-wing libertarians (Murray 2006), and at least two founders of Facebook (Hughes 2018; Zuckerberg 2017), among other Silicon Valley luminaries. Some deem it an inevitable outcome of impending automation-induced unemployment, or at least a necessary bulwark against growing wealth inequality. Experimental evidence suggests that UBI recipients, in addition to experiencing better health outcomes, choose to pursue more education than they otherwise might (Forget 2011). The renewal of higher education as a medium for productive leisure would thus be a likely outcome of a UBI program. Perhaps UBI is the proper horse, behind which the university is just one in its train of carts.

Marina Gorbis (2017), however, raises the concern that the inequality of income distribution is only a subset of the larger inequality of asset distribution. She contends it would be more helpful to think in terms of 'universal basic assets' than UBI. To put it another way, we should be concerned about the means of production before the means of consumption.[2] The recent experience of labor's declining share of wealth (Michel 2012) suggests that fixed wage income—whether resulting from a job or a UBI—stands at a disadvantage against the direct ownership of capital assets, such as real estate, financial securities, or data. Further, wage-based livelihoods can instill a form of dependency, compelling recipients either to deliver their time to the hours expected of a job or deliver their allegiance to the productive sources of a UBI.

This concern, among others was raised as well by Gorz (2011: 207). 'By this payment,' he wrote, 'it holds me in its power: what it grants me today, it can take

[2]For this distinction, I am grateful for a remark by Ed Whitfield at the Left Forum in 2015. See also Whitfield (2017).

away bit by bit, or altogether, tomorrow, since it has no need of me, but I have need of it'. He emphasizes, further, that leisure cannot come at the cost of leverage, of participation, of democracy. 'This is the essential point: that control over the economy should be exercised by a revitalized society' Gorz (2011: 212).

Time is itself a capital asset. Perhaps it should be a universal basic asset as well. Access to leisure is a prerequisite for entrepreneurship, invention, artistic explorations, democratic participation, introspection, and other activities that accompany productive lives. Higher education, another productive asset, depends on leisure as well.

Leisure is the basis of any higher education designed for purposes beyond direct job training. University students and faculty may be very busy, but their time, on the whole, is far less structured than that of typical job-holders. Learning to organize one's time productively is part of the hidden curriculum embedded in university life. (Another frequent part of that curriculum, ritualized drinking, has been remarkably persistent from twelfth-century Paris to today.) Such productive leisure, I have argued, is part of what institutions of higher education in diverse contexts were first developed to enable and protect. It has remained endemic to higher education, even if rarely appreciated as such. If universities are to renew their purpose for an economy in which job-holding bears declining importance and leverage, they are uniquely poised to lead a shift toward expanding access to productive leisure.

What would the university of leisure look like? I defined productive leisure above as 'self-directed time organized to meet collectively agreed-upon standards'; this is not so different from what universities already do, at their best. As they do today, various institutions would have their own specialties, as well as variety within them. Some members might choose to direct their time to sports or video games or the arts, while others might seek to excel in scientific research and others in examining ancient texts. Receiving support would depend on agreements among peers that a given person's contributions are meaningful. The productivity of those contributions would benefit the contributors as well as the co-owned institution as a whole. To support their productive leisure, members might receive short-term stipends and long-term equity.

It is not my intent here to delve too far into the business of details; those are for more minds and experiences than mine to determine. But the critical pivot I propose is that the university reorients its public mission from selling an inefficient job-training product to offering a platform for a liberated time. Such a university doesn't just anticipate the discipline of the market but operates according to values the market hasn't yet learned how to value.

Past experience suggests that widespread leisure will not arise on its own. Productivity has increased through technological and other means, just as Jonathan Edwards and John Maynard Keynes predicted; the dividend of free time didn't follow because there were not institutional structures to compete with those few asset-holders who were able to capture and accumulate most of the surplus for themselves. This may be leading to new feudalism of precarious, gig-based serfdom. Yet the ubiquity, scale, and mission of the university system make it a plausible candidate for stemming that

tide, for redirecting the widespread surplus into widespread leisure. Such a future of leisure is not inevitable; it must be arranged for institutionally.

Although Robert Hutchins underestimated the ease with which leisure would soon arise, he cast a model of institutional creativity in his efforts to ensure that the coming leisure would be filled with education more than frivolous entertainments. Through his leadership roles at the University of Chicago and the Ford Foundation, he established Great Books courses for adults and helped develop what became the Public Broadcasting Service. Like the lifelong students at Al Azhar in medieval Cairo, he sought to fashion institutions to ensure that education would be not just a preparation for life but a way of life. This kind of creativity, and more, will be needed to turn the commitment to productive leisure into a program of institutional reform.

I am probably not the only university instructor who has perceived how poor the media of semesters, lectures, seminars, and term papers are for the job-training we find ourselves increasingly enjoined to provide. That is no accident; this is not the purpose for which these practices formed. There are more efficient and effective ways to learn how to do jobs, as employers well know. What universities are uniquely suited for is the kind of productivity that happens through curiosity and self-management. It is strange that, at a time when the possibilities for leisure have never been greater, universities appear to be heading elsewhere. Perhaps if these institutions centered their purpose around productive leisure, their apparent inefficiencies—including their faculty meetings—would make a fresh kind of sense.

Between Leisure and Discipline

I have made an ambitious proposal for the renewal of the university, inviting it to become at least as vital and transformative an institution as it has been in times past. Yet I do so with trepidation, with the concern that the liberating tendencies of higher education might be overshadowed by its disciplinary—even oppressive—tendencies. Some degree of organizational discipline is necessary, ensuring that the leisure of higher education is also productive. Such discipline can be arrived at in collaborative, democratic fashion and leave ample room for flexibility, exploration, and dissent. But the need for discipline can easily extend into overreach.

Discipline goes back to the origins of higher education, just as liberation does. The students' university of medieval Bologna imposed a strict regimen over the timing and content of faculty lectures, to the point of fining a professor if he opted to skip a chapter in the textbook or save a particularly difficult passage for the end of a session (Rashdall 1895: 198). It is little surprise that Bologna's faculty formed their own guilds to adjust the balance of power. And despite the self-government that the faculty of Paris enjoyed, representatives of Rome policed their teachings for the whiff of heresy. The Islamic and Chinese institutions operated under ideological and political constraints of their own. As Pedersen (1997) emphasizes, the early university was forged through conflict.

When compared with the opportunities for free thought and study outside university settings, however, such constraints were relatively lenient. Each of these institutional formations made possible forms of life relatively protected from the immediate demands of the social order outside them, enabling productive leisure through study, research, and teaching. In comparison, the institutions of higher education developed under colonial regimes, both by the colonizers and the colonized, notably reduced opportunities for such leisure. They recast higher education into merely instrumental forms. Productive leisure, especially according to standards set by participants, doesn't sit well with the task of subjugation.

It is by no means original to say that such habits are taking hold ever more across higher education today (e.g., Giroux 2013). The most elite schools might remain aloof from such outright 'vocational' programs as accounting, auto repair, and military science, but nevertheless they present the value of a liberal education to parents of prospective students in terms of future market opportunities, rather than intrinsic worth, much less leisure. Self-directed time in research and teaching falls victim to market and technological imperatives (Hayes and Jandrić 2017). Protecting space and time for productive leisure is a decolonizing project, especially when it liberates the time of those—the working poor, the colonized, the 'at risk'—who have typically not been entrusted with opportunities for leisure (Shippen 2014). Productive leisure invites people to organize their own curricula and goals, to define for themselves what to do with their time. As stewards of asset wealth, universities should do more to ensure that those who otherwise lack capital access will be the first to obtain it. In this way, again, these institutions can recognize potential value where others fail to notice it.

The need for such decolonization is as evident in Britain and France and the United States as in South Africa and Bangladesh. Anti-colonial thinkers have frequently coupled the task of centering indigenous knowledge in the curriculum with that of protecting university time from the demands of global markets. Mbembe (2016: 30) writes, for instance, 'We need to decolonize the systems of access and management insofar as they have turned higher education into a marketable product'. Alongside calls for African languages in African universities, he decries the time-consuming 'mania' for quantitative assessment and the presumption of servitude to profit-seeking business. If the university is to take a leading role in shaping the next social contracts, we should be anxious to dispense with its market-subservient tendencies.

Self-governance is a deft means of righting the balance between leisure and discipline. For all its disciplinary constraints, the medieval university retained autonomy by being meaningfully democratic; members elected their leaders from among themselves, thereby co-designing the terms of their endeavors. Today, forms of cooperative organization offer a means of pairing such democracy with co-owned wealth. Cooperatives, according to their set of international principles (International Co-operative Alliance n.d.-a), are voluntary, so no such institution should be compulsory (Illich 1971); other kinds of institutions can meanwhile offer their own strategies for liberating time that would appeal to people uninterested in a lifelong relationship to higher education. But I suspect universities are especially well suited to the task.

If universities are not ready to adopt this transformative role in expanding opportunities for productive leisure, other institutions may do so, perhaps relegating universities to the obsolescence that many technologists now predict (e.g., Guerriero 2014). The urge to groom students for future marketability may be too ingrained. A government-funded UBI might do just as well or better at expanding leisure, or entirely new kinds of institutions could arise for the task. Universities, at least, have the virtue of already existing, holding significant wealth and power, and building on a legacy of having enabled past economic transitions through productive leisure. But free time has never arrived by its own volition. It begins when people recognize themselves as worthy of lives freer from want and work.

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Chapter 16
Education for a Post-Work Future: Automation, Precarity, and Stagnation

Alexander J. Means

> Analysis, whether economic or other, never yields more than a statement about the tendencies present in an observable system. And these never tell us what *will* happen to the pattern, but only what *would* happen if they continued to act as they have been acting in the time interval covered by our observation.
>
> (Schumpeter 1947: 61)

Introduction

Amazon, the world's largest digital retailer, has garnered a reputation for being a difficult place to work. Reports indicate that the company has been known to station paramedics outside its distribution warehouses to treat employees suffering from physical and mental exhaustion (McClelland 2012). An investigative journalist for the progressive magazine Mother Jones, who went undercover as a warehouse worker, described the situation as such: 'We are machines, we are robots, we plug our scanner in, we're holding it, but we might as well be plugging it into ourselves' (Ibid). Increasingly, Amazon is replacing these workers with Kiva robots that, needless to say, do not suffer from, or complain about such conditions. In 2015, the New York Times reported that white-collar workers at Amazon are also subjected to a grueling culture consisting of 24 h mandated performance, ritual abuse by bosses, and the annual arbitrary culling of employees, referred to as 'purposeful Darwinism' in company dialect (Kantor and Streitfeld 2015).

While asymmetries in compensation and power remain firmly entrenched, the work culture at Amazon suggests that the precaritization of employment in wealthy societies such as the United States increasingly extends from the menial low-wage worker on the warehouse floor to the salaried professional in the corner office. This

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paper explores technological change as a key component in driving this process and, in turn, how it is opening up emergent conflicts over education and employment within advanced capitalism. As Boltanski and Chiapello (1999) detail, in response to the crisis of Keynesian economic and bureaucratic organization in the 1960s and 1970s, the turn to market liberalism and knowledge economy in the 1980s and the 1990s was supposed provide a new terrain of personal empowerment, creativity, and meritocratic self-realization for workers, particularly those properly invested in developing their human capital through educational training. However, for most workers outside a small elite, this neoliberal 'opportunity bargain,' as Phillip Brown, Hugh Lauder, and David Ashton refer to it, has largely proven to be a 'false promise' (Brown et al. 2011: 15). Indeed, despite steadily rising college completion rates over the last four decades, inequality has deepened across societies, coupled with declining employment security and stagnating wages, particularly among the young, who currently face shocking levels of debt, unemployment, underemployment, and over-qualification for jobs (ILO 2015).

In recent years, critical social science scholarship has observed that there are multiple instabilities within the employment structure of advanced capitalism, from the reality of vast global labor surpluses, to extreme wealth/power differentials, to potentially destabilizing levels of unemployment and precarious employment (Sassen 2014; Srnicek and Williams 2015). It is now increasingly suggested by sociologists, economists, policymakers, and journalists that the advancement of automation is a crucial factor in relation to these trends. This paper considers how mainstream economic conceptions of education and employment are losing coherence as the technological displacement of labor tracks with global economic stagnation and inequality. Importantly, the perspective adopted here is not an assertion that new technologies such as robotics, information software, and machine learning are rendering work obsolete, but rather that they are contributing factors in the present erosion of livelihoods (i.e., jobs and employment). There will, of course, always be useful work that needs to be done; however, it is quite uncertain—given some predictions over technological acceleration—what relation, form, and structure 'education' and 'employment' will take in the future. The paper thus engages in what Bell (1973) once referred to as 'social forecasting' to suggest that if automation and precaritization of employment continue as some predict, this will likely intensify pressure on educational systems to perform for the economy and thus deepen social conflicts over educational access, knowledge production, class, and racial stratification. At the same time, the paper argues that narrow human capital models reduce the capacity of formal education to creatively meet the expansive challenges immanent to a potential post-work landscape by circumscribing the innovative potential of education, knowledge, and subjectivity. In conclusion, the article discusses various perspectives on post-work alternatives for education and society.

The New 'Jobless Future'

Concerns over the displacement of human labor by machines are as old as capitalism itself. A key touchstone is, of course, the Luddite rebellion against the power looms of the early nineteenth century. However, since the Industrial Revolution, economists have extensively debated whether technology can, in fact, generate long-term unemployment (Mokyr et al. 2015). In the nineteenth century, economists such as J. S. Mill and David Ricardo argued that labor-saving technology could have a negative long-term impact on workers and employment (Ibid). Others such as John Baptiste Say rejected the views of Mill and Ricardo. For Say, technology increased overall output, and therefore while technology might displace workers in the short-term, new forms of employment would arise as demand grew to meet supply (Ibid). In his efforts to deepen Ricardo's analysis and at the same time refute Say's assertion that supply creates its own demand, Marx (1973) located the drive to reduce labor with technology as internal to capitalism and its competitive dynamics and contradictions. In the twentieth century, the conservative economist Schumpeter (1947) built on Marx's thought, but argued that the 'gales of creative destruction' inherent to creative entrepreneurship under capitalism are in theory unlimited in their capacity to generate new markets and forms of employment. In contrast, Schumpeter's contemporary Keynes (1930) harbored concerns that technology may evolve to the point where broad categories of human labor are effectively rendered obsolete creating both challenges and possibilities.

Over the last four decades, the prevailing view in mainstream economics has taken its cues from Schumpeter, thus rejecting the 'Luddite fallacy' that technology simply destroys jobs (Tabarrok 2003). Since market forces and new technologies have historically generated many more new job categories than they have destroyed, the belief is that this pattern can and will continue indefinitely into the future. Based on this assumption, mainstream economists, meaning those fashioned in the neoclassical mold, have come to hold a stolid consensus on two key conceptual points: (1) the efficient markets hypothesis, or the notion that if left undisturbed, aggregate private exchanges within self-regulating markets always tend toward equilibrium and full employment; (2) the theory of marginal productivity, which suggests employment and income is determined by the supply and relative productivity of labor (output per worker) based on factors such as the level of educational attainment, acquired skill level, and the value added to productive processes (Wolff and Resnick 2012). Drawing on these principles, mainstream economists typically dismiss the possibility that technology can have long-term negative impacts on employment and the economy. Standard economic doctrine maintains that if left unburdened by state interference, efficient markets combined with new technology, human capital upgrades, and entrepreneurial innovation will generate productivity, economic growth, and new employment, while reducing inequality (Ibid).

While these assertions are justified through the arcane mathematical modeling now central to the economics discipline, when assessed in relation to recent historical trends, they do not appear to holdup to scrutiny (Bellamy Foster and Yates

2014). For example, since the 1970s, there has been a steady decline in economic growth across the highly developed economies of the West. According to estimates by the OECD, without major structural reforms, economic growth will continue to decline over the next five decades to an estimated recessionary rate of 0.54% in core OECD nations and 1.86% in non-OECD nations by 2060 (OECD 2014). Thus, despite the widespread adoption of trade liberalization frameworks, financial deregulation, and neoliberal structural adjustments favoring fiscal consolidation of the state and generous corporate-financial welfare (lavish tax breaks and quantitative easing, as examples), it appears that disequilibrium and stagnation have emerged as the normal condition of advanced capitalism (Galbraith 2014; Streeck 2014). Additionally, since the 1970s, and contrary to marginal productivity theory, there has been a steady weakening in the relationship between productivity and income distribution, as the fruits of technological innovation and economic growth have been appropriated almost exclusively by elite owners, investors, and high-level executives (Bivens and Mishel 2015). There are, of course, multiple factors driving economic stagnation and inequality across societies. Some liberal economists drawing on post-Keynesian perspectives cite the intersection of weak effective demand, decline of unions, and the abandonment of 'rational' economic management by an increasingly plutocratic corporate elite (Stiglitz 2012). However, a growing number of economists, sociologists, journalists, and technology writers are pointing to the technological displacement of workers as a key variable (Ford 2015).

Contemporary concerns over automation can be traced to the 1990s and the rise of globalization and IT revolution. In this era, enhanced mobility of capital and production, automation, outsourcing, and growth of service work, temporary contracting, and 'symbolic analytic' labor began to speed up the displacement of Western manufacturing jobs, erode employment security, place downward pressure on wages, and reconfigure class, ethno-racial, and gendered divisions of labor (Castels 1996; Reich 1991). The acceleration of automation, in particular, led some analysts like Aronowitz and DiFazio (1994), Noble (1995), and Rifkin (1995) to suggest that information technology and robotics threatened a 'jobless future' and/or an 'end of work'. Rifkin went as far as to argue history was entering a Third Industrial Revolution where 'new, more sophisticated software technologies are going to bring civilization to a near workerless world… by the mid-decades of the twentieth century' (1995: xv).

While generating quite a bit of media attention, these predictions were generally dismissed at the time. Channeling the ghosts of Say and Schumpeter, mainstream economists and neoliberal pundits argued that automation might displace some jobs in the short-term, especially those requiring low levels of education and skill, such as in agriculture and manufacturing, but in the long-term, new high-paid, high-skill jobs would be created in the knowledge economy and in IT itself (Autor 2010; Friedman 2007).

This orthodoxy is now being widely questioned and the possibility of accelerating technological unemployment has now become a widely debated topic of discussion even among such mainstream organizations like the OECD, World Bank, and the World Economic Forum meetings in Davos, Switzerland (Brinded 2016). In 2015, The World Technology Network held the first world summit on technological unem-

ployment in New York featuring speakers such as Joseph Stiglitz, Martin Ford, and Robert Reich. The summit took a strong position on potential rapid acceleration of automation:

> Accelerating technological unemployment will likely be one of the most challenging societal issues in the twenty-first century. Never before in history are so many industries being simultaneously upended by new technologies. Though 'creative destruction,' in which lost jobs are replaced with new ones, will be a factor, our newest technologies have the clear potential to eliminate many more jobs than we create. With technology advancing at a geometric pace, robotics, artificial intelligence, 3D printing, and other innovations with enormous disruptive potential will soon hit the mainstream. Billions of people worldwide are currently employed in industries that will likely be affected—and billions of new entrants to the workforce will need jobs. (Quoted in Peters 2017: 1)

This new 'end of work' or 'post-work' speculation often begins with the concept of Moore's Law, which observes that computing power has continued to double roughly every 18 months since the mid-1960s. Named after Gordon Moore, a founder of Intel, Moore's Law suggests that information technology is accelerating, spurring faster innovations in robotics, machine learning, artificial intelligence (AI), big data and algorithmic processing (Brynjolfsson and McAfee 2011). In his book *Rise of the Robots*, Martin Ford, a Silicon Valley software entrepreneur, suggests that these innovations represent an impending shift between human workers and machines, whereby increasingly intelligent machines will make a transition from being tools for workers, to becoming workers themselves (Ford 2015). Ford cites numerous examples of how innovations in big data and algorithmic software stand capable of replacing millions of service and white-collar workers from taxi drivers to stockbrokers. Recent empirical studies give some weight to these claims. In a widely discussed study by University of Oxford economists Frey and Osborne (2013), the authors estimate that over the next two decades, emergent technologies threaten to automate up to 47% of all job categories in the United States. This includes not only 'routine' job categories that have traditionally been susceptible to automation such as in manufacturing and service niches such as bank tellers and supermarket cashiers, but also in 'non-routine' categories requiring advanced machine learning technology such as in white-collar management, legal research, journalism, transportation, telemarketing, and teaching. A small number of mainstream economists, such as former US Treasury Secretary Lawrence Summers (2014), are even beginning to voice that this round of technological innovation may be qualitatively different than in the past and that its impact may be far more rapid and disruptive than either the agricultural or industrial revolutions. As Summers observes:

> A generation from now, taxis will not have drivers; checkout from any kind of retail establishment will be automatic; call centers will have been automated with voice recognition technology; routine news stories will be written by bots; counseling will be delivered by expert systems; financial analysis will be done by software; single teachers will reach hundreds of thousands of students, and software will provide them with homework assignments customized to their strengths and weaknesses; and on and on.… there are many reasons to think the software revolution will be even more profound than the agricultural revolution. This time around, change will come faster and affect a much larger share of the economy. Workers leaving agriculture could move into a wide range of jobs in manufacturing

> or services. Today, however, there are more sectors losing jobs than creating jobs. And the general-purpose aspect of software technology means that even the industries and jobs that it creates are not forever. (Summers 2014)

Mainstream economics tells us that as technology expands and displaces workers, new employment opportunities arise as technology and innovation create new markets and generate growth through rising productivity. However, in their book *Race Against the Machine*, MIT economists Brynjolfsson and McAfee (2011) provide data from the United States Bureau of Labor Statistics that shows the 2000s were the first decade on record in the US in which net job growth was zero, and when accounting for population gains, 18 million new jobs would have had to be added in 2010 to match the total at the beginning of the decade. Additionally, as the number middle-income jobs have declined, the Economic Policy Institute reports that there was no increase in high-paid, high-skill jobs in the knowledge sector, contrary to widespread predictions (Schmitt et al. 2013). Moreover, while economists are divided on the relationship between the information revolution and its relative contribution to productivity, jobs, and growth (see Gordon 2012; Cowen 2011), it is nonetheless indisputable that since the 1970s, productivity has slowly increased alongside GDP, while at the same time, economic growth and real median incomes have stagnated.

These trends indicate that employers have been steadily replacing workers with machines and information software, while as Piketty (2014) has detailed, a small number of elite owners and executives are capturing an ever-higher percentage of the value generated across the global economy. According to Oxfam International, the global imbalances between capital and labor are becoming so stark that by 2016, it is predicted that the world's richest 1 percent will have a combined wealth greater than the bottom 99% of the world's total population (Oxfam 2015). Automation thus tracks with extreme bifurcation of wealth and the precaritization of work, which is elevating the power of capital over labor (Standing 2011). Lanchester (2015) illustrates this asymmetry between capital and labor in relation to the world's most profitable corporation, Apple:

> In 1960, the most profitable company in the world's biggest economy was General Motors. In today's money, GM made $7.6 billion that year. It also employed 600,000 people. Today's most profitable company [Apple] employs 92,600. So where 600,000 workers would once generate $7.6 billion in profit, now 92,600 generate $89.9 billion, an improvement in profitability per worker of 76.65 times. Remember, this is pure profit for the company's owners, after all, workers have been paid. Capital isn't just winning against labor: there's no contest. (Lanchester 2015)

A future where intelligent machines increasingly displace workers would present a number of sobering challenges. As both Keynes and Marx clearly recognized, an increasingly automated economy poses a long-term problem for capitalism as a system. Central here is the problem of effective demand, whereby redundant workers lack the purchasing power to fuel the consumption necessary to promote endless economic growth. Technological displacement could thus aggravate global economic stagnation due to a tendency toward the 'overaccumulation' of capital—defined as

a surplus of capital, productive capacity, and labor supply, alongside a scarcity of opportunities for profitable reinvestment (Harvey 2014). This is problematic not only from the standpoint of political economy, but also from the standpoint of achieving decent livelihoods as well as a modicum of social justice. The remainder of this paper is concerned with thinking about the consequences potential technological unemployment may present to formal education through four perspectives: (1) human capital education; (2) education as 'hidden Keynesianism'; (3) education and cognitive labor; (4) education for a post-work society.

Human Capital Education

Despite present challenges to standard orthodoxy, mainstream economists remain steadfastly committed to the distributional laws of self-regulating markets and marginal productivity. Here, two lines of thought are typically offered in relation to technological change and employment. First, mainstream economists like Cowen (2013) suggest that while technology may prove disruptive for some workers and may increase social inequality in the years ahead, it will also bring unexpected benefits to consumers as innovation makes commodities cheaper by driving down costs of production. The negative effects of the technological change will thus supposedly be offset through the affordability of consumer goods, new digital gadgetry and forms of distractive entertainment, such as immersive virtual reality video games, films, and pornography. As human desires are in theory unlimited, the theory tells us, so too are the potential market niches to serve these desires. Second, and more importantly, mainstream economists ground their perspectives in the idea that education and human capital upgrading can promote economic growth and thereby offset the disruptive consequences of automation by enhancing the capacities of workers to compliment machines, garner a 'wage premium,' and invent the jobs of the future (with technology being a key enabler).

These assumptions now form the basis of global education policy reflected in recommendations by the OECD, World Bank, and World Economic Forum for standardization, privatization, and skill development in education (Rizvi and Lingard 2009). The prevailing viewpoint is that a rising supply of skilled workers (i.e., human capital) through education is a core economic growth strategy that generates employment by raising productivity and stimulating innovation. Hanushek and Wößmann (2007) capture these ideas in a World Bank report, Education and Economic Growth:

> Education can increase the human capital in the labor force, which increases labor productivity and thus leads to a higher equilibrium level of output. It can also increase the innovative capacity of the economy—knowledge of new technologies, products, and processes promotes growth. And it can facilitate the diffusion and transmission of knowledge needed to understand and process new information and to implement new technologies devised by others, again promoting growth. (Hanushek and Wößmann 2007: 3)

These assertions represent the syntheses of neoclassical theories of human capital and endogenous growth theories that broadly animate global education policy today

(Becker 2009; Romer 1994). They also reflect the widely held idea of skills-biased-technological change, which suggests that economic growth, employment, and wages are highly dependent on the capacity of formal education to provide the human capital requirements demanded by technological change (Goldin and Katz 2008). However, a long tradition of critical social science has provided incisive analyses of the methodological and empirical limitations of human capital perspectives and has instead documented how the employment structure and demand for labor is largely generated externally to education systems through the market, power, and status relationships inherent to capitalist societies, while the specific knowledge and skills required for most work is typically acquired on the job (Bowles and Gintis 2011; Bourdieu and Passeron 1977; Collins 1979; Livingstone 2009). Today, while those with advanced levels of education do indeed maintain a stark competitive advantage in the labor market, demand for middle- and high-income employment appears to be eroding, particularly in wealthy nations. For example, the National Employment Law Project has found that a majority of jobs being created today in the United States are clustered in precarious, low-skill service niches that do not require high levels of education, skill, or training, at places like fast-food restaurants and strip malls that offer very low pay and few if any benefits (NELP 2014). Their data indicates that employment losses in the United States during the Great Recession were concentrated in middle and upper-income employment, while employment gains during the 'recovery' have been heavily concentrated in low-wage sectors—lower wage jobs constituted 22% of recession losses, but 44% of recovery growth; middle-wage jobs constituted 37% of recession losses, but only 26% of recovery growth; higher wage jobs constituted 41% of recession losses, and 30% of recovery growth (Ibid). This has occurred even as educational attainments have steadily risen in the US.

Additionally, alongside declining middle and upper income employment, and despite popular perceptions to the contrary, there is also evidence to suggest that the world economy may, in fact, be facing a surplus of educated workers relative to demand, whereby there are more workers with advanced credentials, such as in the celebrated STEM fields, than there are jobs in those fields (see Teitelbaum 2014). For instance, according to a report by the Economic Policy Institute, for every two students graduating with a STEM degree from a US university each year, only one is hired directly into a STEM job (Salzman et al. 2013). In information science and engineering, the report indicates that the US graduates 50% more students than are hired into those fields each year, while real wages for these workers have plateaued at late 1990 levels. Further, among computer science graduates who do not end up entering the IT field, 32% say it is because IT jobs are simply unavailable (Ibid).

As Brown et al. (2008, 2011) have succinctly detailed, there really isn't a global 'knowledge economy' where the demand and value of formal educational credentials, knowledge, and technical skills continues to rise, but rather an 'economy of knowledge' that is 'transforming the relationship between education, jobs, and rewards' (2008: 142). 'The overriding problem,' they convincingly argue, is 'a failure to lift the demand of knowledge workers to meet the increasing numbers entering the job market with a bachelor's degree (2008: 142).

Ultimately, human capital theories and policy discourses do not provide an adequate response to the challenge of automation and precaritization of employment as they rest on the faulty assumptions that education by itself reduces inequality and creates jobs and new economic growth (see Madrick 2013; Schmitt et al. 2013). Thus, surpluses of low and high skilled labor, erosion of the economic standing of the educated middle class particularly in the West, and the specter of automation mean that human capital theories are losing credibility for addressing economic stagnation, rising inequality, and precaritization of employment within advanced capitalism. However, this is unlikely to staunch demands on educational systems to perform for the economy and families and/or reduce commitments to educational expansion as an ostensibly meritocratic and politically feasible mode of economic intervention for states and regions.

Education as 'Hidden Keynesianism'

Technology intensifies competition for educational credentials and employment within a stratified economy of knowledge. The global mobility of transnational capital means that corporations are able to leverage a 'global labor arbitrage' to find the cheapest possible labor (both low and high skill), which puts them in a commanding position in relation to labor and the State (Bellamy Foster and McChesney 2012). Within this context, even tepid attempts by governments to increase minimum wages, limit executive pay, reign in financial excesses, and/or raise revenue through progressive taxation are often swiftly met by threats of capital flight and faster automation. For example, Foxconn, the Apple subcontractor in China that makes iPhones and iPads, responded to a wave of worker suicides and incipient unionization in their sweatshop factories by promptly announcing that they would invest in deploying a million robots to replace workers over the next decade. Similarly, campaigns to unionize and raise the minimum wage in the United States by fast-food workers have been met with threats to fully automate restaurants. The Washington Post reports that in the wake of growing minimum wage protests, fast-food chains are busy 'looking for ingenious ways to take humans out of the picture, threatening workers in an industry that employs 2.4 million wait staffers, nearly 3 million cooks and food preparers and many of the nation's 3.3 million cashiers' (Depillis 2015).

Polarization of global labor markets and high levels of unemployment and underemployment track with deepening class stratification and racial-ethnic disparities/tensions across societies and educational systems (Therborn 2013). Critical sociology might suggest that as the labor market and income becomes increasingly stratified, we can observe a similar 'correspondence' in the unequal funding arrangements, outcomes, and hierarchical sorting functions of educational systems (Bowles and Gintis 2011). Despite well-noted limitations (Giroux 1981; Livingstone 1995), there is much insight to be gleaned from such perspectives. However, a central aspect of current social and educational stratification often overlooked in critical analyses,

which often focuses its attention on the poor and dispossessed, concerns the institutional knowledge and vantage point of salaried professionals and elites.

Across Western societies like the US, global competition and new technology increasingly threaten to undermine the economic position and social status of salaried professionals, along with their offspring. Within an environment of economic stagnation and intensifying competition for economic opportunity, salaried professionals and elites are now making unprecedented investments of time and money in order to build their children into perfect *living resumes* capable of outcompeting their rivals (often formerly middle class) for positional goods such as education and employment (Reardon 2011). These living resumes must have the right mixture of relentlessness, diversified portfolios of interests and activities, and just the right plucky air of employability in order to access slots in the elite universities, which are considered prerequisites to attaining internships and well-remunerated work in the new economy. However, as Collins (1979) has observed in his studies of the credential society, the competition for positional advantage for employment drives an arms race over educational attainments. This, in turn, drives educational inflation as the status and value of each degree awarded is reduced relative to the number of individuals seeking and attaining them. The higher number of degrees awarded, the more competition among degree holders for employment opportunities at any given level. As increasing numbers of young people seek to complete postsecondary education, employers respond by raising their minimum educational requirements as screening, or filtering mechanisms. This occurs despite the fact that work-related skills are not typically set by the demands of technology, or learned in educational settings, but are rather acquired on the job and/or through informal networks (see Livingstone 2009).

As labor market insecurity has increased and the neoliberal state reduces its role in direct employment, formal education becomes more deeply implicated in a global arms race for access to social resources, degree certificates, and viable employment opportunities. Within this context, Collins (2013), perhaps counterintuitively, argues that credentialism and expansion of education may very well provide a stopgap, or 'escape valve' to assuage some of the most disruptive consequences of mass technological unemployment, which he views as an imminent threat, particularly to the middle class. Collins suggests that education may act as a form of 'hidden Keynesianism' that both deflects and absorbs the structural insecurities associated with advancing automation and precaritization of employment. First, formal education functions as a mass public works project employing large numbers of educators, administrators, service, and auxiliary personnel (these workers are nonetheless at risk of obsolescence from the digital integration of virtual learning, MOOCs, and adaptive learning systems), which pumps money into flagging economies. Second, educational expansion restricts the flow of labor into the employment sector thereby keeping formal rates of unemployment and underemployment artificially low. One would be tempted to add here that educational expansion is also an increasing source of profit within a stagnating real economy, both directly through the widespread privatization of educational services, and indirectly through the financialization of tuition through student debt. Collins observes:

> Although educational credential inflation expands on false premises—the ideology that more education will produce more equality of opportunity, more hi-tech performance, and more good jobs—it does provide some degree of solution to technological displacement of the middle class…Educational expansion is virtually the only legitimately accepted form of Keynesian economic policy, because it is not overtly recognized as such. It expands under the banner of high technology and meritocracy—it is the technology that requires a more educated labor force. In a roundabout sense, this is true: it is the technological displacement of labor that makes school a place of refuge from the shrinking job pool, although no one wants to recognize that fact. No matter—as long as the number of those displaced is shunted into an equal number of those expanding population of students, the system will survive. (Collins 2013: 54)

The problem here is that educational expansion as 'hidden Keynesianism' runs up against funding barriers as government budgets are squeezed from multiple angles in a time of austerity. Additionally, as students take on growing levels of debt in order to secure and fund their access to higher education, families will continue to expect and demand a high rate of return on investment that governments and the economic system may be increasingly unable to provide. However, as societies and individuals engage in the same tactics to gain competitive advantage, education is implicated in diminishing returns on investment. For instance, it is now common to observe that a college diploma is the new high school diploma—a prerequisite for entry into even the lower strata of the labor market. Over time, the value of a 4-year college degree may also decline as the number of individuals attaining them increase. The essential point is that rather than a catalyst for limitless individual upward mobility, human capital coheres to the logic of scarcity and diminishing returns, whereby inflation of credentials is used as a screening mechanism *that artificially create barriers to entry* for desirable job opportunities. The sociologist Wright (2015) has referred to this as 'opportunity hoarding':

> High levels of education generate high income in part because of significant restrictions on the supply of highly educated people. Admissions procedures, tuition costs, risk aversion to large loans by low-income people, and a range of other factors all block access to higher education for many people, and these barriers benefit those in jobs that require higher education. If a massive effort was made to improve the educational level of those with less education, this program would itself lower the value of education for those who already have it, since its value depends to a significant extent on its scarcity.…While some of the higher earnings that accompany higher education reflect productivity differences, this is only part of the story. Equally important are the ways in which the processes of acquiring education excludes people through various mechanisms and thus restricts the supply of people available to take these jobs. (Wright 2015: 6)

Alongside these mechanisms of exclusion, in recent years the insecurity of dominant groups and middle classes has increasingly been translated into politics of racial and anti-immigrant resentment, as signified by the strengthening of right-wing political movements, such as alt-right Trumpism in the United States, UKIP in Britain, the National Front in France, and Golden Dawn in Greece. It has been observed that professional class parents, even those with self-described progressive views, are prone to resist redistribution of educational resources, and/or strategies to improve class and ethno-racial integration, if it is perceived that these measures will diminish the advantages their own children maintain over working class and historically

marginalized, ethnic and racial minority groups (see, for example, Kohn 1998). In this sense, the idea that education can function as a form of 'hidden Keynesianism' not only must contend with the deeper structural instabilities of capitalism, including the potential for mass technological unemployment, but also how such economic crises would become articulated in educational systems through the class, ethno-racial, and gendered conflicts and political dynamics immanent to neoliberal social formations (De Lissovoy 2015).

Education and Cognitive Labor

Above, the problems confronting human capital education and education as a form of 'hidden Keynesianism' have been highlighted as responses to automation and precaritization of employment. There is another perspective on technology and education worth considering here. In recent years, there has been a growing body of work in social and educational theory highlighting the progressive potential of the information revolution, particularly in relation to knowledge production and cognitive labor. Building on notions of new growth theory (Romer 1994), the postindustrial society (Bell 1973; Touraine 1971), the network society (Benkler 2006; Castels 1996), the creative economy (Florida 2003; Howkins 2001), and autonomist theories of cognitive capitalism (Boutang 2007; Vercellone 2007), educational theorists have observed how education—particularly higher education within the so-called 'learning society'—has taken on a central economic position as knowledge production, entrepreneurship, and technology become primary drivers of innovation and valorization (Olssen and Peters 2005; Peters 2010; Peters and Bulut 2011; Peters et al. 2008).

A problem that emerges in some of this literature can be located in a utopian element that suggests the shift to cognitive capitalism and network technologies are generating new educational and labor arrangements characterized by decentralization, openness, flexibility, and nonmarket production. Such perspectives are based on the idea that knowledge is in principle limitless and is now capable of being endlessly digitally reproduced at zero marginal cost. As capital is increasingly dependent on cognitive labor and the valorization of knowledge, it is argued that the free circulation of knowledge in digital networks is undermining traditional conceptions of property, scarcity, and hierarchy. Those like Benkler (2006), Rifkin (2014), and Mason (2015) have suggested that these dynamics are creating more open and cooperative relationships that push beyond traditional conceptions of capitalism, education, and labor through platforms such as peer production, open sourcing, creative commons, and sharing economies. However, while it appears that digital technology has generated new knowledge platforms with interesting implications for traditional intellectual property arrangements, these thinkers have tended to ignore or downplay the centrality of class antagonism and power in relation to education and cognitive capitalism. For instance, as those like Braverman (1974) have pointed out, labor arrangements under capitalism not only function to produce profit, but to discipline workers and maintain class/race hierarchies and social control in the workplace, even

at the expense of achieving greater efficiency in production. More recently, Graeber (2013) has detailed the vast expansion of bureaucracy under neoliberalism and proliferation of mindless administrative jobs, or what he calls 'bullshit jobs,' that he argues have little productive purpose, or social value other than to keep potentially superfluous workers busy and employed. A similar logic can be observed in contemporary higher educational policy and structure, as narrow human capital discourses are used to justify greater standardization, privatization, administration, casualization, and automation of university labor, curtailment of emphasis on intellectual foundations and nonproprietary research, and expansion of narrow degree programs thought to have direct economic utility, such as in business administration. Educational studies of the knowledge economy have tended to overlook the most obvious contradiction here—namely, that the knowledge economy is often presented as a catalyst for bureaucratic decentralization and openness that requires advanced creative, analytical, affective, cooperative, entrepreneurial, and inventive subjectivities, while in practice, it is often embedded within reductive logics of control that inhibit open institutions and the mass intellectuality required for broader economic, social, and technical development (Means 2018; Newfield 2008).

Education for a Post-work Society

The perspectives outlined above signal that there is a potential crisis of legitimacy for the now deeply engrained narrative of economic advancement and endless upward mobility through individual educational investment. At present, this legitimacy crisis is assuaged through the thin veneer of meritocracy provided by neoliberal tropes of market freedom and individual reward through the work ethic, interpreted increasingly as devotion to educational advancement for workforce preparation. This tracks with the proliferation of discourses of grit and resiliency now omnipresent in educational policy and neoliberal culture (Evans and Reid 2014; O'Brien 2014). Such discourses have the effect of using appeals to education to privatize the structural conditions of stratification and insecurity immanent to a potential employment crisis in advanced capitalism. There are simply no guarantees that these appeals can be ideologically maintained if the mainstream economic framing of human capital education continues to lose coherence and credibility.

Simultaneously, advancing automation of jobs, coupled with stagnation and rising inequality within the global capitalist system and across societies has generated an interesting conversation on potential alternatives. Orthodox economists like Summers (2014) and Cowen (2013) who recognize the scale of potential disruption of technological displacement, nonetheless cling to a sense of dystopian inevitability that the laws of self-regulating markets and marginal productivity should be allowed to operate unhindered no matter the consequences. In this perspective, there is little that societies and individuals can do other than to invest in formal education and upgrade their human capital to compete for a shrinking pool of viable employment opportunities.

Second, other more forward-thinking economists, journalists, and technology writers advocate for resurrecting the views of Keynes on technological unemployment—namely, a redistribution of work hours and profits through State management (Quiggin 2012). Post-Keynesian perspectives suggest that technological change is not something to be feared or resisted, rather it is something that can be harnessed to achieve a more efficient capitalism and humane foundation for work and society. This would include instituting a guaranteed basic income and reinvestment of surpluses from rising productivity into public projects and direct employment such as in the green economy.

Third, there is a growing body of radical perspectives on the post-work society. These theories more or less accept the need to institute post-Keynesian reforms in the short-term, such as a guaranteed basic income and systems of work sharing. However, where they depart is that they question the long-term viability and/or desirability of capitalist work arrangements as well as capitalism itself as a system of production and distribution. For instance, drawing on and reworking premises found in various strands of Marxian analysis, those like Rifkin (2014), Mason (2015), Boutang (2007), and Hardt and Negri (2009) argue the unfolding wave of technological change and centrality of knowledge is undermining capitalism and inexorably leading to a postcapitalist society of horizontal networks, where private property and wage labor are superseded by collaborative commons. Others like Srnicek and Williams (2013, 2015) also see the potential in accelerating technology to liberate human activity from the dialectic of capital and labor, but they argue that this is inherently contingent and uncertain, requiring the left to achieve 'sociotechnical hegemony,' to reformulate institutions with transversal lines of power and authority. In her particularly insightful contribution, Weeks (2011) draws on autonomist Marxism and feminism to argue that any viable conception of the post-work society requires a fundamental refusal of the separation of economy and polity under liberalism, as well as the cultural logic of the work ethic, that reifies wage labor and depoliticizes the sphere of work. This refusal is not a rejection of work as productive human activity in general, but the specific way wage work attenuates, stratifies, and limits the full range and potentiality of our individual and collective efforts. In this sense, refusal is a valorization of human activity outside the strictures of wage labor and a verification of the intrinsic creativity and generative force of human labor, affects, and subjectivities.

There is much to be gleaned from each of these perspectives. However, it is interesting to note that while education factors prominently within mainstream economics, it is largely absent in post-Keynesian as well as in radical post-work perspectives. This seems to be a missed opportunity. If the technological displacement of employment indeed does accelerate, it will be necessary to rethink the relation between education and livelihoods. In their book *Inventing the Future*, for instance, Srnicek and Williams (2015) discuss at length the need to creatively harness new technological possibilities in the service of restructuring society, prevailing common sense, our work arrangements, and our institutions. However, where education does appear in the book it is largely to describe its historical, economic and ideological functions to produce docile, competitive, and compliant workers for a stratified employment structure. While Srnicek and Williams observe that educational institutions repre-

sent a site of social and political struggle, they remain stuck in a mode of economic reductionism by suggesting the main point of contestation in education should be to expand heterodox research of economics and teaching of heterodox economic perspectives (Srnicek and Williams 2015: 141–144).

What is missing here is a deeper sense of how the economic, the political, the epistemological, the ontological, and the pedagogical intertwine and might be reimagined across the full spectrum of informal and formal educational institutions, programs, research, theory, and experiences. This would imply a reconfiguration of educational value and purpose. Such a reconfiguration might usefully be directed at producing educational subjectivities with the intellectual capacities, technical literacies, and ethical imaginations to subordinate technology to egalitarian and sustainable ends. Achieving an equitable, just, efficient, and ecologically sustainable political economy would require concerted struggles over the formative educational cultures and institutions that play a central role in the production of knowledge and the shaping of social cooperation and agency. These struggles are contingent and embedded within the class, ethno-racial and gendered structures of power, division, and antagonism that give shape to social conditions under advanced capitalism. However, while the future is inherently contingent, predictions of technological acceleration throw the orthodox human capital edifice of education for employment into doubt, and with it, the mainstream economic rationalities upon which the legitimacy of the neoliberal project depends. Ultimately, this may present an opportunity to develop a new rational technical and liberatory educational foundation for a post-work society to come.

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Chapter 17
Refusal of Work, Liberation of Time and the Convivial University

Patrick Carmichael

Introduction

Emergent technologies, both digital and non-digital, are changing the nature and distribution of work. Accounts of these changes in the popular media have tended to focus on the extent to which current jobs will be replaced by automation, robots or artificial intelligence: a recent BBC web-based quiz asked, 'Will a robot take your job?' and invited readers to test their 'automation risk' (BBC 2015). Despite this, more nuanced accounts and forecasts of the impact of various kinds of automation vary widely. This variation often reflects the extent to which authors take account of whether automation has already been introduced, the impacts it has already had, and the importance they attach to social relationships, creativity, and the need to deal with complex problems in work environments. This leads to marked differences between the predictions of, for example, Frey and Osborne (2013) whose work was the basis for the BBCs quiz, and Nedelkoska and Quintin (2018) in their report for the OECD. In a recent report for the International Labour Organization Nübler (2016) suggests that focusing on automation in isolation is insufficient and identifies two interrelated trends: the automation of processes using combinations of material and digital technologies, and the fragmentation of those processes both within organizations and across geographical space through networking, outsourcing and subcontracting. Together, these have the potential, not to simply 'replace' existing workers, but rather to bring about complex patterns of voluntary and involuntary economic migration, worsening working conditions, under-employment, and precarisation across a wide range of manual, skilled and professional work.

At the same time, there is, as Frayne (2015) describes in his recent book *The Refusal of Work*, a fetishization of work (what he calls the 'work dogma'); a contrived collegiality of workplace 'crews' and 'teams'; and a celebration of workaholic

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behaviours. This is accompanied by a political rhetoric that seeks to demonize the workless and those who choose, or even just seek, to extricate themselves from alienating cycles of work and consumption. In fact, Frayne argues, workers are caught in a 'double bind' because the nature of much employment allows them only limited opportunities and time in which to cultivate other interests, skills and social ties on which they might draw if and when they do become unemployed (2015: 110). Those who seek to do so may be identified as 'thieves', 'time bandits' or 'parasites' by their employers (Martin et al. 2010; Brock Baskin et al. 2017).

When discussions about the inevitability of automation and associated technological unemployment turn to the implications for education, they tend to stress the need for learners to adaptable, resilient and prepared for lives of precarity. Nübler's report for the International Labour Organization captures this:

> The main issue in education and training today is no longer about "what skills should be delivered" but "how to train the labour force" and what institutions are needed to generate the knowledge base and social capabilities that allow the economy to create new jobs in new sectors. (Nübler 2016: 23)

This presents challenges for educational institutions, and in particular, newer universities committed to widening participation in higher education. These have been most concerned with improving the employability of their graduates, and have devoted much time and energy to developing key 'skills for life' (in the UK, a key recommendation of the Dearing Report of 1997 (National Committee of Inquiry into Higher Education 1997: 133). They are encouraged to develop partnerships with stakeholders including employers, government bodies and professional organizations, and to link the education and training they offer to employer needs in order to address 'skills imbalances' (Cole and Tibby 2013; OECD 2016) and to become 'demand-driven': a recent report from Pearson suggesting that their priority should be to offer courses that focus on 'ensuring graduates are job-ready' and that they 'respond to signals from society to ensure alignment between desired qualifications and available training' (Deegan and Martin 2018: 7).

Responses from higher education institutions often involve the deployment of digital technologies which themselves employ increasing levels of automation, and which focus on training needs and the demonstration of graduate attributes, at the expense of pedagogical practices and social interaction. Peters et al., point to these phenomena as being aspects of:

> … a cultural shift where we are all implicated in a use of language about education, technology and employment, that effectively edits out references to the real human labour that is required to address social issues. (Peters et al. 2019: 244)

It is currently unclear what the future relationships might be between education and employment, and while as Means (2017: 24) suggests, the driving force might currently be for existing and emergent educational systems to 'perform for the economy … deepen[ing] social conflicts over educational access, knowledge production, class and racial stratification', this very lack of clarity may allow space for more the emergence of a diversity of more radical and emancipatory models of higher education.

This chapter seeks to contribute to this debate by exploring how the theory and practices of the 'refusal of work' might inform thinking about future educational systems and their relationship to employment. From a student perspective, the key issue it will address is how their educational experience might be reframed, so that the curriculum they follow is not defined solely in terms of skills required for jobs that may soon cease to exist; involves pedagogies which are oriented towards developing generic attributes to allow them to be 'agile' but are, in fact, based on an assumption of indefinite precarity; and which defines the benefits of education in terms of their personal employability in a jobs market in which they are in competition both with other humans and automated rivals.

It will consider two strands of thought, each bringing their own rationale for the refusal of work, and each of which has implications for educational practice. Both involve not only critical accounts of specific working conditions, but of the concept of work itself. The first of these strands is rooted in the *operaismo* that emerged in the 1960s in Italy, and whose theoretical and practical activities in response to social change, automation and casualization were an important basis for subsequent 'autonomist' Marxism. Activists and writers including Panzieri and Alquati developed analyses that explored the complexes of work and social life; identified means by which workers could extract themselves from established cycles of capitalist production; and argued for new forms of autonomous organization, cultural creation and self-valorization. The second strand is centred on the work of André Gorz, whose humanist, environmentally oriented socialism, combined with scepticism about workerism led him to speculate about the emergence of future societies in which time was liberated and new forms of autonomous and self-directed social activity could replace waged labour.

The Abolition of Labour and the Refusal of Work

In one of their early works, subsequently published as part of the *Economic and Philosophical Manuscripts of 1844*, Marx and Engels write of the essential tension facing the worker under capitalism:

> The less you eat, drink and buy books; the less you go to the theatre, the dance hall, the public house; the less you think, love, theorise, sing, paint, fence, etc., the more you save, the greater becomes your treasure which neither moths nor rust will devour: your capital. The less you are, the less you express your own life, the more you have, the greater is your alienated life, the greater is the store of your estranged being. (Marx and Engels 1959: xv)

This alienation can be overcome, and human self-realization and free activity achieved only through the replacement of capitalist relations and specifically by the 'abolition of labour'. Labour, in the sense that Marx and Engels define it, is so intrinsically bound up with capitalist mode of production, with the definition of the proletariat, and what of it is to be a worker, that liberation must be 'directed against the hitherto existing mode of activity, does away with labour (*die Arbeit beseitigt*)'

(Marx and Engels 1968: 80); elsewhere they argue that labour is already 'free' under capitalism, and revolutionary struggle is not a matter of freeing labour but rather of abolishing it (*sie aufzuheben*) (1968: 80). As Marcuse says, according to Marx, 'liberation of the individual is at once the negation of labour', and the aim is the creation of a society 'wherein the material process of production no longer determines the entire pattern of human life' (1999: 293–294). The abolition of labour for Marx is not an encouragement to idleness, despite Lafargue's spirited critique of demands for the 'right to work' in his 1883 polemic *The Right to be Lazy* (Lafargue 1989). Rather, it allows the development of new modes of productive activity which Marx variously refers to as 'free activity,' (*Selbsttiitigkeit*) or 'self-activity' (*Selbstbetiitigung*), and, in later writings, 'self-purpose' (*Selbstzweck*) as distinguished from 'purposeful activity' (*zweckmäßige Tatigkeit*) which is performed in order to achieve a purpose outside itself (Zilbersheid 2004: 119–120).

A number of authors have attempted to trace the history of the concept of the abolition of labour, most of whom identify some form of retreat from the idea, either on the part of Marx himself or of subsequent leftist theorists. Probably the best known of these is Marcuse's (1999) *Reason and Revolution*; while Thoburn (2003) discusses the associations between abolition of labour and the work of, amongst others, Negri, Virno, Guattari, and Deleuze. Franco Berardi in his *The Soul at Work: from alienation to autonomy* (2009) also offers a distinctive reading of Marx on alienation and the political praxis that might be developed in response to it. Zilbersheid discusses what he calls the 'viscissitudes' of the idea of the abolition of labour, and explores how, despite its importance in visions of future communist society, it came to be neglected, or even negated, both in leftist political programmes and theoretical analyses. He writes of its central role:

> At the core of the highest phase of communist society, as described in Marx's early writings, is the abolition of labour. The more famous abolition of private property, the well-known abolition of the state, and the lesser- known abolition of the division of labour are all conditional upon the abolition of labour itself. (Zilbersheid 2004: 117)

In Marx's early writings, these links are explicit, but in later writings, both he and Engels retreat from this position to a greater or lesser extent. Zilbersheid contrasts the humanism of the early Marx with the assertion, in the final volume of *Das Kapital,* that labour is inevitable, part of the 'sphere of necessity' only beyond which begins a 'realm of freedom… which… lies beyond the sphere of actual material production.' (Marx 1959: xlviii). In other later works such as Marx's *Critique of the Gotha Programme* and also in Engels' *Anti-Duhring* and *Socialism: Utopian and Scientific,* (all published between 1875 and 1880), this emphasis on reorganization, rather than abolition, of labour is again evident. This is perhaps attributable to the fact that by the time of the writing of the final sections of *Das Kapital* and these other essays, factory work and automation had become established to the extent that prior notions of a return to craft and artisanal production were seen as implausible and utopian.

Marx's *Grundrisse*, written between 1857 and 1860, stands at the crossroads between the 'early' and 'later' Marx and since its first publication in the Soviet

Union in 1939–1941, its wide-ranging content and diverse analyses have led to extensive exegesis. It has been identified by 'New Left' scholars as exemplifying Marx's humanism, Gorz highlighting its model of a 'rich individuality which is as all-sided in its production as in its consumption, and whose labour also therefore appears no longer as labour, but as the full development of activity itself' (Marx 1973: 325). Zilbersheid (2002) also highlights 'utopian' continuities between the early writings of Marx, sections of the *Grundrisse,* and the writings of Marcuse and Fromm. Other sections of the *Grundrisse*, notably the 'Fragment on Machines' (Marx 1973: 690–712) have served as something of an *urtext* for waves of scholars and activists identifying as operaist, post-operaist, autonomist or post-capitalist. It has been taken as a starting point for retheorization of work as a system in which the dominant capitalist subject controls working class subjects through the imposition of work and valorization is imposed according to capitalism's rules. The central struggle of the working class, therefore, is to break with the cycles of capitalism through the refusal of work, and in Negri's analysis, to develop new means of 'self-valorization' (Pitts 2017).

Despite these theoretical developments, the Marxisms that have dominated the twentieth century have been concerned with the reorganization, rather than abolition of labour; and many workers' organizations and leftist movements continue to make demands framed in terms of the improvement of working conditions, the level of wages and the protection of jobs including, recently, in the face of new patterns of automation and technological unemployment.

Both *operaist* analyses and Gorz's writings on work and education identify the *Grundrisse* as a significant antecedent; and both challenge Marx's notion of the 'polytechnic worker' with oversight of the whole of production, enabled by the introduction of automation and able to engage in non-instrumental self-activity. Instead, they argue that capitalist introduction of automation has led not to the abolition of manual labour but rather to system-wide changes increasing the alienation and precarity of skilled workers, technicians and professionals (Gorz 1987: 27–29). The remainder of this chapter will focus not on the ideal of the abolition of labour as an aspect of a future society as envisaged by Marx, but, rather, on the refusal of work as a radical praxis which in turn has implications for curriculum, pedagogy, teachers and learners.

Operaismo and the Refusal of Work

Operaismo, which is usually translated into English as 'workerism', is conventionally associated with the foundation of the journal *Quaderni Rossi* in 1962, although it was rooted in broader debates and fractures within the *Partito Comunista Italiano* (PCI) and *Partito Socialista Italiano* (PSI) concerning responses to post-Stalinism in the USSR; political analysis of the particular circumstances of Italy, and in changes in class composition; and, of most interest here, in relation to the nature of politically oriented social inquiry (see Wright 2002 for a discussion of this background).

Operaismo was influenced by readings of the *Grundrisse* (Thoburn 2003: 106), and Tronti writes that:

> We didn't bring *The Condition of the Working Class in England in 1844* with us to the factories, we brought the struggle of the workers against the work in the *Grundrisse*. We were not moved by an ethical revolt against factory exploitation, but by political admiration for the processes of insubordination that they invented. (Tronti 2012: 126)

The intention was not to be drawn into a minute re-examination of original texts, but rather to explore the realities of everyday working life, particularly in new industries in which precarity and fragmentation were the norm, and in contexts where automation was changing workers' lives both within and beyond their workplaces. This in turn informed new self-organized social formations, and forms of activism more militant than those organized through established employer–worker committees. Operaist analyses characterized the latter as part of 'neo-capitalism' which involved close coordination of capital, industry and trades unions in cycles of mass production and mass consumption (Tronti 2010: 186).

A key figure in *Quaderni Rossi* was Raniero Panzieri, for whom reinvigoration of Marxist theory would accompany the political renovation of the labour movement in ways that were specific to the Italian context. Central to this was a notion of workers' inquiry (*l'inchiesta operaia*), that began not in social or political theory or methodology, but was instead 'hot inquiry' (*inchiesta a caldo*) stemming from the situated, subjective experiences of workers who found themselves facing, for example, worsening working conditions; personal precarity caused by automation; or the intrusions of work into other aspects of their social lives (Panzieri 1994: 126). Workers' inquiry typically involved detailed empirical investigations into the division of labour within workplaces; mapping of the ways in which time was spent both in and out of work; critical reading of organizational documents and data; and autobiographical accounts and diaries. Some later forms of workers' inquiry involved highly innovative approaches, the 'interview to the double' being an example that used the premise of going undercover into a participant's workplace (as their 'double') in order to explore tacit knowledge, workplace micropolitics and subjective experience (Nicolini 2009).

Perhaps the most influential of such inquiries were instances of co-research (*conricerca*) carried out by Romano Alquati, who focused on workplaces such as the factories of Fiat and Olivetti as they underwent cycles of automation (Alquati 1975). For Alquati, co-research was not merely a form of social inquiry undertaken to understand these changes: it represented instead a critically important form of activism which developed workers' abilities to understand the mechanisms of their alienation, challenge these, and ultimately to extricate themselves from the constraints of capitalist labour (Alquati 1993). This involved supporting workers in reframing their concerns beyond working conditions to explore more expansive political and social questions, Alquati writing:

> There develops and clarifies for them a correspondence between conditions of labour and the social system… when the demand of today: "fundamentally, what does FIAT give me?" transforms… into another: "What different things can I hope for in a society dominated by businesses like FIAT? (Alquati 1975: 38)

Operaismo also explored the idea of the 'social factory' whereby society as a whole was organized according to the same principles of domination, production and consumption as the workplace, although its critics have argued that while attention was paid to domestic labour, for example, this was still explored through a theoretical lens that ascribed a central role to the industrial 'mass worker'. According to this perspective, education can be seen not as a separate domain, but as a particular form of work, and teachers and students are not separated from workers as 'intellectuals'. Students are workers in formation: already linked to the productive cycles of capitalism, not only by virtue of the marketization of education, and employer input into curriculum and pedagogy, but through the need to work to fund their studies, or by having opportunities to study constrained by their involvement in other forms of labour (often gender-specific) in the social factory. The everyday life of academic workers (students, teachers, researchers and others) blurs the spatial and temporal distinctions between home; school, college or university; and work, making educational settings both social factories in their own right (Selwyn 2014: 71) and part of a broader social factory tied to capitalist production.

Alquati's accounts of work at Fiat and Olivetti presaged developments that have affected not only industrial settings but other sectors of the economy including education. Already, in the 1960s, automation was not simply replacing mundane manual labour, but, as Alquati described, highly trained and supposedly highly invested technicians were already becoming regarded as dispensable, with their roles being reduced to piecework or replaced entirely (Alquati 1975: 37–38). Aspects of traditionally manual labour were becoming 'intellectualised' and demanding of new techno-literacies, while at the same time skilled and intellectually demanding work was becoming proletarianized and precarious. Contemporary patterns of automation are continuing this pattern of not simply replacing manual labour but also making inroads into middle-class jobs, compounding the 'professional precarity' already enabled by marketization and neoliberalism. So, while the specifics may differ from the situations about which Alquati and Panzieri were writing, there remains the potential for self-elucidating workers' inquiry and co-research as a basis for radical refusal of work. Alquati's 'model' question regarding FIAT could easily be reframed to ask student workers in formation to consider 'What different things can I hope for in a society dominated by businesses like Amazon or Uber' or, alternatively, 'What different things can I hope for in a society where automation has led to widespread technological unemployment, including my own?'

Summarizing the operaist position on refusal, Thoburn argues that 'the refusal of work can… be seen as… a propulsive force towards inventive practice within and against the productive regimes of the social factory' (Thoburn 2003: 111). Rather than the abolition of labour as an aspect of an idealized future communist society, in *operaismo,* the refusal of work, together with workers' inquiry and co-research, represent a radical praxis; an active means of exploring alternative ways of being outside capitalist cycles of production and consumption. Before discussing in more detail what this might involve in the context of higher education, it is important to examine the rather different perspectives on work, refusal and education of André Gorz.

André Gorz, the Liberation of Time, and the Fictions of the University

Andre Gorz was an associate of Marcuse, Fromm and Illich and like them was influenced by the 'early' Marx; alienation and the means to overcome it represent a unifying theme across much of Gorz's writing (Howard 2016). Like the *operaisti*, Gorz saw in the *Grundrisse* the articulation of a future ideal of work which had failed to materialize, and in *Farewell to the Working Class*, published in France in 1980, he was critical of most Marxists' continuing concentration on the industrial working class. He argued that their leading role had been so eroded that other groups and movements—elements of the 'social factory' in operaist terms—were better able to mount challenges to capitalism, not least because of their lack of acceptance of an ethic of work. In this respect, there are parallels between Gorz's ideas and autonomist theorizing, notably by Negri in his characterization of a new proletariat of 'socialised workers' for whom points of resistance to capitalism extended beyond the workplace (Bowring 2004; Wright 2002).

What Gorz offers that is rather different, and in particular in his response to automation, is an emphasis on *time*. Frayne, who uses Gorz's ideas to frame his empirical study of individual refusal writes:

> The underlying coherence of Gorz's project… lies in his promotion of a *politics of time,* i.e., a critical, open-minded, and democratic discussion around the goals of production and the social distribution of working hours… in Gorz's view, one of the most pressing questions faced by capitalist societies now, at the pinnacle of their productive capacities, is the question of what should be *done* with the time being saved by these gains in productivity. (Frayne 2015)

While Gorz conducted studies of how companies were addressing this question, he argued that the answer is not to be found in managerial responses but rather in a public discourse around the liberation from work and the liberation of time (Gorz 1989). The outcome of this should be that individuals are more autonomous in how, when and at what they choose to work, inverting the argument in Marx from the *Grundrisse* onwards, that individuals would always be required to labour in the 'realm of necessity' in order to enjoy autonomous self-activity. Gorz was an early advocate of the idea of universal basic income or 'social income', arguing that this provided a practical means by which individuals could determine how and when they worked, with this working extending to study and training, or undertaking 'convivial' activities (Gorz 1985: 42). For Gorz, automation was a key means of liberating time, and enabling new autonomous collectivities and activities. Again, citing the *Grundrisse*, he suggests, perhaps overly optimistically:

> The disappearance of market laws, just like the disappearance of the law of value, is an inevitable consequence of automation. Better then to break openly from capitalism than to shore up its façade with all kinds of subterfuge. (Gorz 1985: 45)

In fact, Gorz's views on technologies and automation were directly related to their potential to enable rather than to constrain conviviality. For example, he wrote in

Farewell to the Working Class in 1980 that computerized socialization of autonomous activities and newly liberated time threatened to reduce people to 'passive users of commodity objects, information and programmes' (Gorz 1987: 84). By 2003, however, in *The Immaterial: Knowledge, Value and Capital*, he wrote of the potential of digital networks to enable conviviality and saw open source and free software as a model for other forms of cooperative creativity outside capitalist cycles of production and consumption (Gorz 2010: 121–125).

There is another reason why Gorz's work is relevant to this volume's concern with educational responses to technological unemployment. Gorz, like his associate Ivan Illich, advocated radical transformation of education systems and the social and work structures that they reflect and reinforce. Much as Illich argued in *Deschooling Society* that education through schooling is impossible in educational settings as currently conceived (Illich 1971) and that current educational practice needs to be replaced by peer-to-peer 'learning webs' (Illich 1990), Gorz, writing in 1970, saw universities as beyond reform and called for their 'destruction' (Gorz 1970). The university, according to Gorz,

> … isn't functional either in relation to the demands of capitalist economy or in relation to the demands of those who want to overthrow capitalism; it dispenses neither a "useful culture" nor a "rebellious culture" … it dispenses a *university culture.* (Gorz 1970)

This culture propagated the notion that, as well as fulfilling the requirement of the economy, the mission of the university was to enable social mobility, but, recalling Bourdieu's critique of the role of the *Grandes Écoles*, Gorz suggests that:

> The ideology of the academy is that of the equality of chances for social promotion though studies … this equality has always been fictitious. (Gorz 1970)

If the university neither adequately serves the capitalist economy, nor enables social mobility, while at the same time stifling dissent, their role needed to be completely redefined:

> The moment we accept that studies don't lead to a career, we must redefine the nature of studies, their content and their meaning; since they don't confer a "useful culture" they must confer a "rebellious culture;" since they don't correspond to a demand of society's, they must respond to the demand of those who make it and who intend to destroy that society, abolish that division of labour. (Gorz 1970)

Gorz's call for the destruction of the universities was written in response to the reform of the French University system in the late 1960s, but it does raise interesting questions. First, what are the 'fictions' of contemporary higher education particularly in relation to automation, and, second, how might they be transformed?

In relation to automation and the potential for significant changes in the nature and distribution of work, a key fiction is that the relation between university education and employability. At the very same time that 'modern', teaching-intensive universities, in particular, have been orienting their courses, teaching and assessment in order to maximize the employability of their graduates, the workplaces for which they are ostensibly being prepared are undergoing radical changes. Despite indications that increasing numbers of students are not taking up employment in jobs directly related

to their areas of study (Cunningham 2016); and despite the number of graduates in what have been traditionally non-graduate jobs such as retail; and the rapid turnover of new graduates in professions such as teaching and social work, this fiction exerts a powerful grasp not only on university managers but on students themselves. Gorz offers an insight into the phenomenon of employment prospects being reified into a measurable and personal 'employability'; he describes how the 'tyranny of the factory' (or other workplaces) means that students are already very much aware of how they need to orientate their education towards employment. This means that when placed in pedagogical situations, even ostensibly open-ended ones, they 'teach themselves according to the practical-theoretical demands of their praxis' (Gorz 1973: 64).

A good example of this from the author's own experience relates to initial teacher education students who in their final year, close to graduation and qualification as teachers, undertake practice-based dissertation projects. Despite the parameters of the project and the assessment criteria being deliberately couched in broad terms and inviting critical reflection on their experiences as trainee teachers, the vast majority choose topics calculated to appeal to potential employers (including the schools in which they undertake their research inquiries), or which demonstrate their competencies in relation to a set of national standards. Just at the moment when they are best placed to undertake more critical inquiry, the spectres of debt and precarity direct them towards a particular performance of personal 'employability'.

Another set of fictions relates to the 'value' of university education in general. When students pay fees, take out loans, or postpone entry into employment, choosing instead to undertake university education, they are, in effect taking up what Brown et al. (2011) describe as a neoliberal 'opportunity bargain,' which has, they argue, largely proven to be a 'false promise'. Berardi (2009: 140–141) highlights how a student taking out loans to pay for education may find that, several years later, changing employment conditions mean that 'S/he will have to accept any condition of work, any humiliation, in order to pay back the loan which follows wherever s/he goes'. The risks associated with this expensive 'gamble' are exacerbated by the prospects of automation and associated unemployment, but also by other changes such as the casualization of what has previously been secure, salaried jobs for which university courses have traditionally been a preparation – including the trainee teachers mentioned above.

The significance of these issues is that that they represent points of departure for 'hot' inquiry and co-research, and even for what Alquati describes as 'counter-research': critical inquiry capable of challenging assumptions and fictions (Sacchetto et al. 2013). Combining Gorz' radical politics of time with the critical inquiry of the *operaisti* provides both a means of exploring the current landscape of higher education and articulating multiple subjectivities, but also of generating ideas about what roles universities might play in a society in which simplistic notions of education as preparation for work are challenged from within or disrupted by societal changes. They are also a starting point for overcoming alienation from academic work in which students choose (and, for that matter, universities offer) courses and modules without any orientation towards 'self-purpose' or 'free-activity'. The achievement

of personal autonomy on the part of learners depends on these fictions being recognized, challenged and ultimately overturned, allowing the reframing of the question (following Alquati, once again) from 'fundamentally, what does education give me?' into 'what different things my education might give me - if my studies were not tied to employability, and did not represent a risky gamble on an uncertain, potentially automated future?'

The Autonomous Learner and the Convivial University

Just as the 'refusal of work' and a 'politics of time' represent a radical praxis in relation to workplaces, so too do they inform radical, critical praxis in education. The realities and potential of automation, and associated changes in the nature of work, open a space for debate: in this case, about the nature and purposes of education itself. Gorz offers some suggestions as to what a radical politics of time might enable, and suggests that, if 'freed time' is to be more than 'empty time' (effectively, involuntary underemployment), it needs to develop a 'politics of collective facilities' concerning sites for democratic processes, play, self-directed labour and education; and a 'politics of voluntary cooperation, allowing the development of… local, non-market, collective services'. Universities, then, can serve both as part of collective facilities, but also provide spaces for learning and working cooperatively and convivially. He also makes the case again for a basic income or 'wage for life' to enable these (Gorz 1985: 103–104), both in order to break the cycles of flawed opportunity bargains and gambles on indebtedness, and in order to realize a politics of freed time.

Currently, education allows opportunities for productive and critical 'exile' (Giroux 2016) and the generation of counter-hegemonic discourses, but the challenge to be met is how to go beyond individual accounts of refusal and resistance and to construct a more comprehensive, collective and forward-looking counter-narrative to contemporary 'neoliberal' capitalism. There have been other accounts which have drawn upon operaist and autonomist ideas, proposing that higher education be realigned to develop mass intellectuality rather than being oriented towards production and profit (Hall 2014, 2016). Neary and Winn (2017) have explored how higher education based on the cooperative movement would allow learners to take control of the means of production within the educational sphere. What the perspectives on refusal described here offer are models where, rather than taking control of the means of production and reorganizing labour, entirely novel forms of labour and self-actualization are enabled and legitimized. Similarly, the notion of the autonomous learner needs to extend beyond offering choice within the limited parameters of an education oriented towards employability, and instead invite wider reflection on the focus of study, while encouraging speculative and creative responses.

This is perhaps where Gorz' work is most important, as it explicitly invites us to consider what form and role higher education might take in the future. It suggests

that higher education should become more concerned with cooperative pedagogical projects that are not premised on the ideas of endless growth and unlimited material resources, but rather cooperative and environmentally sustainable alternatives. Following Illich's call for 'deschooling', Gorz's ideas suggest the key shift that needs to take place (institutionally, pedagogically, and in the minds of learners) is to see education not a preparation for uncertain future work, but rather but a form of autonomous activity which might take place alongside, integrated with, or as episodes along with, other forms of convivial activity.

In the shorter term, *operaismo* provides a theoretical framing and a set of practices to allow exploration of educational settings; of changing workplaces; and of other aspects of the 'social factory'. Cooperative co-research that breaks down the distinction between teachers and learners, and between the university and the workplace, would allow the challenging of fictions, the identification of sources of alienation, imaginings of alternatives, and assessments (following Gorz) of how emergent technologies might contribute to greater autonomy and conviviality. The sensitivity to subjectivities and context that such inquiry involves can manifest in what Kitchens (2009) describes as 'pedagogies of situatedness': rather than of 'placelessness', the latter assuming that 'skills' are transferable attributes of workers who will necessarily be mobile and precarious and locked into cycles of self-training. The university takes on a role as a nexus; a collective facility; a site for conviviality within and of a particular community, linked by networks to other communities around the world. Universities, at least for the present, retain sufficient autonomy and independence to be able to position themselves to fulfil this role, and there are opportunities for counter-hegemonic activities and conviviality to emerge and prevail. This chapter will, therefore, end with on an optimistic note, with an example of emerging conviviality in action.

In 2012, changes in the law in the UK removed the right to legal aid for 'family reunion' (FR), whereby individuals who have been granted refugee status can apply for family members, often children, to join them in the UK. Publicly funded legal advice and support for applications were simultaneously being cut back as part of 'austerity' measures, and at the same time, the application process was transformed into an online-only one (Beswick 2015). While final decisions to grant or refuse applications were still taken by humans, limited guidance was provided as to how to meet acceptance criteria, and feedback on unsuccessful applications was scant. The human and social were effectively removed from the FR process, fully or part-automated advice services (often monetized) often being the only sources of information for applicants who in turn were grappling with an automated application process.

The University of Bedfordshire, working with a local refugee advice service, and a solicitor who provided pro-bono advice, established a law clinic specifically to support FR applicants. This was partly framed by the university's intention to position itself as a 'civic university' while also providing students with useful work experience. Interest in the work of the clinic and the nature of the student learning that it enabled led to funding from the Legal Education Research Network (LERN) to evaluate its outcomes. While the project was initially conceived of in term of

broader practice-based inquiry (Gherardi 2012; Nicolini 2012), the findings from the evaluation can equally be interpreted as involving a form of workers' inquiry; and the evolving role of the clinic understood in terms of Gorz's politics of conviviality and collective facilities.

Initially, students described their motivations for participation in the law clinic in terms of improving their own knowledge and gaining experience, and while they were motivated by a desire to help refugee families, most were concerned to minimize any affective aspects, talking about maintaining 'professional relationships' and 'knowing where to draw the line and… keeping your emotions in check'. However, many of the participating students shared the languages and cultural backgrounds of applicants and were able to support them in ways that legal professionals could not. Through their casework, the students developed a critical understanding of the workings of the online application system and the ways in which it frustrated and alienated applicants; and through interviews and collection of biographical information, they gained insights into the working and social lives of newly settled refugees.

The opacity and complexity of the online application process meant that students needed to go beyond the official guidance provided and carry out careful, forensic investigations into the workings of the online system in order to determine how it required the submission of certain data, while constraining other responses, and limiting opportunities to provide contextual information. As in the case of co-research promoted by *operaist* activists, they went from seeing the online system as a process to be learned, to undertaking a critical and continuous exploration of how the automated system operationalized the management of the FR process and reflected changes in immigration policy.

Students also came to understand about what it meant to be a legal worker, which was, for many, at odds with previously held, idealized ideas or one reified into a set of graduate attributes or transferrable skills. Their engagement with clients attending the clinic, and often their frustrations with the FR process, caused them to revisit their ideas about their work in terms of clearly bounded 'professionalism' and several talked about the novel experience of 'taking their work home with them'. Working with FR applicants also provided some of them with their first exposure to the world of commercial legal services, some of whose working practices they found disturbing and even predatory. In interviews, it was clear that this was a significant factor in shaping their ideas about the types of legal employment they might seek in the future.

While the students' activities can be seen as a form of emergent workers' inquiry, the work of the legal clinic more generally can be understood in terms of Gorz's politics of collective facilities and cooperation. In the face of changes which involved extensive automation, and which were removing or monetizing legal advice work, this initiative reintroduced the human and social into the process. Rather than seeing FR applications as a form of work experience with an associated set of skills to be learned, participating students came to see it as an ethical choice, self-actualizing and convivial. The legal clinic transcends and challenges the boundaries of the university, providing a radical third space which seeks not to replicate commercial legal practice but rather to enable new forms of social interaction and collective learning.

Five years on, the clinic still operates, providing support and advice to FR applicants from all over the UK. Former students who have participated and who are now employed, some in legal work, albeit precariously, continue to be involved as volunteers and as mentors to new students, carving out time from paid work to do so, and it is interesting to consider what the impact of a guaranteed wage for life or universal basic income would allow them to do in this regard. The detailed knowledge of how to operate within the changing parameters of the FR system is shared beyond the university, and most critically, many families have been reunited.

This is the kind of politics of collective facilities and of voluntary cooperation that Gorz envisages: a microcosm of how universities could work more generally. But as universities themselves change in their character, themselves becoming subject to automation, editing out the human and deprioritizing the social, it is clear that the time to think beyond employability and about convivial futures, is imminent. Waiting to see what forms automation takes, and how technological unemployment or 'post-work' emerges may allow the door to close on such inquiry and deliberation: 'do nothing' is simply not an option.

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Chapter 18
Moving Beyond Microwork: Rebundling Digital Education and Reterritorialising Digital Labour

Michael Gallagher

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' (Chui et al. 2015). 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. 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 unorganised 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

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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 remained 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 (Mtsweni and Burge 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). The 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 is 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 provide (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 the 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 labelling 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 organisation 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 organisations 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, whilst 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, whilst 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 organisational 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 microwork 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 is, 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 work into 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 an 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 Eynon 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).

Reterritorialising: 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 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 (Arora and Thompson 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 Eynon 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 modelling 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' labourers and 'menial' labourers, 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 reterritorialisation 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 post-human 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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Chapter 19
The 'Creative, Problem-Solving Entrepreneur': Alternative Futures for Education in the Age of Machine Learning?

Jeremy Knox

The Rise of Machine Learning

In recent years, mainstream media has been awash with promises of revolutionary change brought about by the technologies of 'machine learning' (for example Tank 2017). Often portrayed as 'the new AI [Artificial Intelligence]' (Alpaydin 2016), there is growing acceptance of the ways machine learning techniques have influenced, not only computer science, but also a broad range of 'empirical science' disciplines, as well as a much wider sphere of industry concerned with data processing (Jordan and Mitchell 2015).

Machine learning is a general term for a range of specific programming techniques that seek to create software that can be *trained* to complete particular tasks. It is frequently described as being in contrast to traditional notions of computer programming due to this 'learning' function: in machine learning, human programmers do not write exhaustive programmes in order to complete tasks, they create software that learns for itself, ostensibly in more efficient and succinct ways (Alpaydin 2016). This 'training' is usually undertaken by making use of large data sets, from which software can 'learn' particular patterns. This is more accurately what is being proposed in notions such as the 'big data revolution' (Mayer-Schonberger and Cukier 2013); it is not simply the huge volumes of data that can be collected that is significant, but the insights that can be derived from it, and encoded into working algorithms. Machine learning software is, therefore, able to 'automatically improve through experience', and 'has emerged as the method of choice for developing practical software for computer vision, speech recognition, natural language processing, robot control, and other applications' (Jordan and Mitchell 2015: 255).

This flourishing interest has been accompanied by enthusiastic calls for the development of a 'master algorithm' through machine learning that has an intimate and

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perfect understanding of the world (Domingos 2017). Therefore, and perhaps unsurprisingly, the efficient functioning of machine learning techniques has proved to be of great interests to economists and businesses. A recent working paper from the National Bureau of Economic Research, a leading non-profit organisation in the US, predicts a profound impact on the future of the field, entailing not only more robust procedures for economic prediction, but also the opening up of new kinds of questions and research methods (Athey 2018). It is in the world of business that machine learning appears to be generating the most interest, demonstrated, not only by the sheer abundance of articles in leading business publications, such as *Forbes*, but also by the way that machine learning is explained in explicit commercial terms (for example Bhatia 2017). This overwhelming media attention frames machine learning, unmistakeably, in terms of business interests, whether involved in generating new strategies and insights from existing company data, or developing new commercial ventures entirely.

Perhaps most significantly, however, has been the way in which this discourse has also, somewhat curiously, involved both an increasing effort to develop and expand the field of machine learning through education, as well as often embellished accounts of the technological unemployment resulting from the future proliferation and application of such techniques.

Machine Learning 'Disruptions' in Education

Perhaps stimulated by suggestions that the 'data scientist' should be considered the 'sexiest job of the twentyfirst century' (Davenport and Patil 2012), or even that such roles are currently in high demand (Domingos 2017), educational opportunities for training in machine learning appear to be on the rise. One of the most prominent educational initiatives in recent years has been the 'Massive Open Online Course' (or MOOC), gaining unprecedented mainstream media attention, and attracting huge amounts of venture capital funding (Knox 2015). Aside from the hyperbole around the potential for MOOCs to induce a wholesale disruption of the higher education sector (for example Marginson 2012), they have played a highly significant role in raising the profile of machine learning in education. Often portrayed as the first of the platform-based MOOCs *Introduction to Artificial Intelligence* (now hosted on the Udacity platform at https://eu.udacity.com/course/intro-to-artificial-intelligence–cs271) established the relationship (see Rodriguez 2012). Media reporting at the time emphasised the reputation of the course instructors—Peter Norvig and Sebastian Thrun, the latter being well known for his directorship of the Stanford Artificial Intelligence Lab, and work on Google's autonomous cars—as the primary motivation for the considerable number of course enrolees (Matson 2011). Andrew Ng and Daphne Koller, co-founders of the largest MOOC provider Coursera, are both well-known machine learning researchers associated with Stanford University. It is no surprise, then, that machine learning has featured prominently not only in Coursera's offerings, but also in the platform software itself in the form of the

dashboards and analytics that process learner data. Rankings of MOOC popularity position Andrew Ng's own course *Machine Learning* (see https://www.coursera.org/learn/machine-learning) on Coursera in second place, with over a million enrolees to date (Online Course Report 2017). At the time of writing, the term 'machine learning' returns 198 results in the Coursera course search. Similarly, the edX platform returns 61 courses involving machine learning. As Shah's (2018) research has demonstrated, the majority (19.9%) of MOOCs offered fall under the category 'Technology', defined as 'Computer Science, Programming, and Data Science' (it is also notable that 'Business' courses come in second at 18.5%—see Shah 2018). Alongside supposedly providing a kind of technological disruption of general higher education, the MOOC must also therefore be understood as involved in the advocacy and promotion of machine learning specifically. As we shall see, the role of MOOC pioneers does not end here.

Another important example here is the recent launch of educational resources as part of the 'Google AI' website (see https://ai.google/education/). While the site serves as a showcase for Google's A.I. research, it also appears to view its mission as one of training public participants in the principles of machine learning, offering a range of freely accessible resources, including a 'Machine Learning Crash Course'. A quote from Jeff Dean, a senior fellow at Google, states: 'We want to use AI to augment the abilities of people, to enable us to accomplish more and to allow us to spend more time on our creative endeavors' (Dean n.d.). This notable reference to A.I. taking on routine tasks specifically for the purpose of providing time for 'creativity' is a common response, and will be discussed further below. What is important to emphasise here, however, is a portrayal of pioneering educational work through MOOCs and Google's A.I. ventures, where individual figures and organisations from the technology sector are seen as promoting innovative opportunities for training in machine learning and associated techniques.

However, while online opportunities to engage in a machine learning education appear to be flourishing, formal schooling is often viewed as maintaining more traditional computer science curricula and forgoing the trend. A recent report by The Royal Society (2017: 6) on the 'patchy and fragile' state of computing education in UK schools, notes machine learning as an example of the specific disciplinary skills desired by employers. This perception that formal schooling is out of step with the technology industry has given rise, and credence, to significant national campaigns in the US (see https://code.org/), the UK (see http://www.yearofcode.org/) to teach children, not about machine learning specifically, but more significantly, the 'computational thinking' that underpins these specific techniques. The consequence of this underlying 'world view' will be discussed further in the final section. For now, the pertinent question is how machine learning has been able to garner such appeal in education, whether in the form of persuading millions of online participants to sign up to a MOOC, or in the guise of national campaigns computer science education? The Pearson report *Intelligence Unleashed*, provides a tangible clue, making as it does a strident case for the transformation of the education sector with the use of 'AIEd' (artificial intelligence in education) (Luckin et al. 2016):

> AIEd will … contribute a proportionate response to the most significant social challenge that AI has already brought – the steady replacement of jobs and occupations with clever algorithms and robots. (Luckin et al. 2016: 12)

As such, machine learning and education seem inextricably tied to the discourse of technological unemployment. As Athey (2018: 27) concludes, right alongside the importance of 'educating the future workforce with empirical and data science skills', there is also a pressing need to understand 'the issues experienced by parts of the workforce who need to transition jobs when their old jobs are eliminated due to automation'. In order to understand how machine learning is impacting education, its role in the renewed discussions of technological unemployment must be taken into account.

Machine Learning and Unemployment

The current swell of interest in machine learning and A.I. (the significance of the relationship between these terms will be discussed further in the subsequent section) has resurfaced long-standing questions about the role of technology in unemployment. Frey and Osborne's (2013) prominent study measured of the susceptibility of 702 current occupations to the technological developments of machine learning and robotics. Identifying high, medium, and low risk occupations, the study highlighted, not only transport, logistics, administration and office work, but also jobs in the service industry as being under threat (Frey and Osborne 2013). The research was picked by the BBC in the UK, who published an interactive webpage based on Frey and Osborne's (2013) data, allowing users to search for particular occupations and receive a percentage result for the 'likelihood of automation', and a ranked score (see https://www.bbc.co.uk/news/technology-34066941). Provocatively titled, 'Will a robot take your job?', the article translated the extensive report into a highly accessible, and substantially simplified, resource that propelled the issues around machine learning and technological unemployment into mainstream attention. This example, and the general discourse around machine learning, challenge more established views of technological unemployment, which tend to frame issues largely according to the supposed mechanisation or automation work that involves manual labour. Where machine learning is concerned, 'the trend toward increased automation of white-collar jobs is clear' (Ford 2016: 117). The shift in interest is unmistakably concerned with what has previously been seen as highly skills professions, including banking, law, journalism and medicine.

Stock market trading is perhaps the best-known area being affected by sophisticated data-intensive computational techniques. Johnson et al. (2013: 1) influential paper describes an emerging 'machine ecology' in the global financial market, and suggests a proliferation of 'predatory algorithms' involved in high-frequency transactions. Subsequent reports have decried the *en masse* replacement of financial analysts by automated software (Popper 2016). Multinational law firm Clifford Chance

recently announced a partnership with the software company Kira systems to make use of machine learning systems to undertake specific legal tasks, such as document analysis (for example Ward 2016). A host of other big name law firms appear to have followed suit, employing machine learning to undertake specific aspects of due diligence, such as 'expert legal research, contract review and e-discovery' (Gunashekar 2017). It is also worth noting that formal education has certainly not been exempt from these changes. As Ford (2016) notes, the considerable resistance from teachers in the US and UK towards the 'algorithmic marking of written essays' (2016: 133) attests to the lively development of machine learning for educational purposes, particularly in relation to assessment. Unsurprisingly, it is the 'disruptive' MOOC platforms, such as edX (see Markoff 2013), that are advancing with machine learning systems for automatically grading student writing. Machine learning appears not just to be involved in analysing text, but producing it as well. As Ford (2016: 86) highlights, it is business publications such as the aforementioned *Forbes* that are utilising third party machine learning software to 'produce automated articles in a variety of areas'. While it is unclear whether the articles describing machine learning in commercial terms, as mentioned previously, were themselves written by automated software, it seems unmistakeable that professional writing has joined the list of occupations 'under threat'. The message from these prognostications seems to be that, it is not only jobs involving routinized activities that are imperilled, but also 'many employment types that compromise the so-called knowledge economy, especially those jobs held by "symbolic analysts"' (Peters 2018: 552).

Another highly publicised example involves Geoffrey Hinton's claims about the impending demise of the radiologist, published in the New Yorker (Mukherjee 2017). Hinton's suggestion was that sophisticated image analysis driven by machine learning should encourage hospitals to cease training new radiologists, as the technology would soon make the occupation obsolete. The subsequent publishing of research with the 'CheXNet' algorithm—machine learning software capable of analysing X-ray images for signs of pneumonia (Rajpurkar et al. 2017)—was controversially promoted on social media by none other than the aforementioned Andrew Ng, with the question: 'Should radiologists be worried about their jobs?' (see https://twitter.com/andrewyng/status/930938692310482944?lang=en). What is most significant to highlight here is the very public and explicit framing of this technology as directly instigating future unemployment, broadcast by probably the best-known machine learning *educator* on the planet.

Aside from merely 'high skilled' professions, machine learning also purportedly threatens the kind of jobs that 'have previously been seen to be impervious to automation' (Peters 2018: 552). As Ford (2016: 110) claims, 'machines are starting to demonstrate curiosity and creativity' (this is despite Luckin et al. (2016) acknowledgement that curiosity and creativity are difficult traits to measure in human beings, let alone machines). Thoma (2016) examines the use of machine learning in the 'creative' generation of images, text, and audio. Notable examples include the production of images through a technique called 'inceptionism' (see https://ai.googleblog.com/2015/06/inceptionism-going-deeper-into-neural.html). Developed by Google engineers, the technique utilises the ability of machine learning to recognise objects as

a way of distorting existing images through feedback loops. Elgammal et al. (2017: 18) have also proposed a system called Creative Adversarial Networks (or CAN) for 'generating art with creative characteristics'. The CAN system is able to train itself on existing artwork using machine learning, but also demonstrate creativity, it is suggested, by deviating from learned styles (Elgammal et al. 2017). Also outlined by Thoma (2016) is the software named 'Emily Howell' developed by David Cope, which is capable of composing music independently. While Thoma (2016: 5) concludes that 'it is obvious that machine learning algorithms cannot compete with human artists', avoiding the more inflammatory suggestions of imminent unemployment, it seems clear that, however, one chooses to define notions such as 'creativity', the boundaries between humans and machines are being redrawn. The notion of 'creativity' is especially pertinent to this discussion of the role of education. As we shall see below, 'creativity' is precisely where those concerned with the rise of machine learning situate the future of the 'human' aspects of educational practice.

Of course, interest in technological employment has a long and established history. While it is beyond the scope of this chapter to articulate this in any great detail, it is worth noting that such discussions haven't always tended towards the dramatic. With specific reference to education, Moffatt and Rich (1957: 270) offer a measured view of the impact of automation on employment, suggesting a 'technological displacement of workers' rather than the straightforward loss of jobs, where increasing automation creates the requirement for new kinds of skills. However, they also noted that alongside the need to decrease low skilled workers, the figure of the 'maintainer' would become more prominent, perhaps anticipating—although from a pre-digital era—the need for training in data-intensive techniques:

> 'The maintainer, in all his manifold positions, becomes far more significant with the increase of automation. The 'servicing' and 'adjusting' sides of maintenance are daily requirements when automation is in use- and they must be provided continuously without interrupting productive processes'. (Moffatt and Rich 1957: 271)

With such a historical view, one might be tempted to view technological unemployment in terms of ebb and flow, as various technology innovations and social events arise and recede (Ford 2016). This also mirrors research in A.I., for which machine learning represents the current peak in activity, and where a lack of attention and investment is referred to as a 'winter' (see Knight 2016). However, two further questions need attention. First, is there indeed, as the media attention previously discussed tends to claim, a qualitative difference in machine learning that requires the rethinking of the relationships between technology and work, and thus education? And second, following whatever might be concluded from the first question, what is the position and role of human beings, especially in that most 'human' of projects: *education*.

Automation or Autonomy?

As the advocacy for machine learning seems to imply, there is a significant shift towards the independence of technology. A pertinent distinction to underscore here, then, is between: systems that are *automated*, that is, capable of carrying out predefined tasks without the direct assistance of human beings; and systems that are *autonomous*, that is, able to act and produce outcomes without precise predefinition by human designers. This distinction is important because automation would seem to be a subservient position for technology, in which humans have already designed, and learned, the best way of achieving a particular task, and a mechanised or computerised system is put in place to execute the predetermined steps. Autonomy, on the other hand, would seem to abdicate some of this responsibility to machines. For de Visser et al. (2018: 2), an autonomous system is defined by the 'capability to learn and change over time, dynamically setting its own goals, and the ability to adapt to local conditions'. Furthermore, they suggest that '[d]esigners may preside over the start state and parameters of such systems, but once deployed, autonomy will evolve with use in different environments' (de Visser et al. 2018: 2).

Such a view of autonomy would appear to reflect the general definitions of machine learning, which, as previously outlined, position the software as able to 'learn' for itself, through processes of being 'trained' on large datasets. This is the principal way in which machine learning might be considered 'autonomous'. In this sense, once it has been trained, it is able to produce outputs that haven't necessarily been predefined by a programmer, as opposed to the ways more traditional 'programming' might be regarded. As Jordan and Mitchell (2015: 255) suggest, 'it can be far easier to train a system by showing it examples of desired input-output behavior than to program it manually by anticipating the desired response for all possible inputs'. In a more technical sense, Alpaydin (2016: ix) describes the general process of machine learning as one in which a 'learning algorithm modifies a learner programme automatically in such a way so as to match the requirements specified in the data'.

However, it is worth examining such claims of autonomy in detail. First, it is perhaps significant that the term 'machine learning' encapsulates something of the technical means through which such software operates, and has developed through research. However, the term doesn't appear to acknowledge the activities for which such technologies have been developed: not simply *learning* with data, but rather, once some degree of learning has taken place, being employed to *undertake* particular tasks. The issue here is that while the research basis has been able to substantiate the case for *machines capable of learning*, the notion of what one might then call a *learned machine*, able to act upon its learning and have a concrete role in a particular sector or industry, appears to be, at least currently, somewhat overestimated, and without sustained empirical enquiry. Machines clearly appear to be able to learn independently, as well as being able to act in ways not defined specifically by their creators. However, a full sense of autonomy would be harder to justify.

Importantly, this is not just a philosophical argument, but a practical one as well. A recent special report in *The Economist* (2018) highlighted a pertinent warning

from businesses about the feasibility of A.I. systems in context. Using the example of IBM Watson, a system that achieved considerable recognition by winning a highly publicised game of Jeopardy in 2011 (see Best 2013), concerns are expressed about the ability to utilise machine learning 'products' without considerable modification and customisation, such that the software is able to function meaningfully within the specific contexts of the organisation that has purchased it. This brings us to a crucial distinction between machine learning and 'A.I.' as it might be more commonly understood. Despite being largely synonymous in media reporting, 'A.I.' has much broader connotations with respect to the capacity for 'intelligence' in machines: so-called 'general AI' refers to attempts to create the kind of wide-ranging intelligence attributed to humans, yet this tends to have been dismissed in recent years as research has pursued much more 'narrow A.I.', in the form of machine learning. In other words, machine learning refers to high performance at very specific, focused, and highly repetitive tasks, rather than general faculties, such as awareness, understanding or indeed 'intelligence'.

With such a definition, one might draw attention to the variation apparent in most 'white collar' professions, such as would counter the notion that machine learning software might straightforwardly 'replace' a particular working professional. However, to simply dismiss such claims as mere hyperbole would overlook their powerful discursive influence. Rather, the key point here is to highlight prominence and potency of this rhetoric, and the way it appears to both drive the technological unemployment agenda, as well as urge sweeping changes in formal education. Questioning suggestions of autonomy are important because, not only it is upon that basis that jobs are presumed to be 'under threat', but, as we have seen, it also appears to be the central justification for promoting machine learning and associated techniques as necessary for contemporary educational curricula.

Preserving 'Human' Learning

As Aoun (2017) makes clear, it is education that has played a central role in assisting workers to withstand the economic changes brought about by previous technological disruptions, such as the industrial revolution and the information age. While machine learning may well present a qualitative difference in the kind of social and economic change that might unfold, education is habitually pinpointed as the key to fulfilling the optimistic vision of a prosperous future society imbued with intelligent machines (Aoun 2017; Luckin et al. 2016). Key to this discourse, which can be understood as an educational response to the overdetermined claims of machine learning autonomy, as well as to the accompanying claims of technological unemployment, is a concerted effort to reposition the human student at the centre of the learning process, recast as a kind of creative, problem-solving entrepreneur. As such, contemporary education tends to be portrayed as in crisis, and ill-equipped to develop students with the uniquely 'human' qualities necessary to take advantage of increasingly intelligence systems. In this sense, educational interest in A.I. is disposed to focusing any attention

concerning 'learning', or indeed 'intelligence', squarely on the human beings making use of the machines. For Luckin et al. (2016), the purpose of A.I. in education is to:

> help teachers to equip learners – whatever their age – with the knowledge and flexible skills that will allow them to unleash their human intelligence and thrive in this re-shaped workforce. (Luckin et al. 2016: 12)

Where the discourse around machine learning challenges the exceptionality of human abilities, those forecasting the future of education appear determined to put 'learners' back in control. As Aoun (2017) suggests:

> rather than raise the white flag on humanity … we need a new model of learning that enables learners to understand the highly technical world around them and that simultaneously allows them to transcend it by nurturing the mental and intellectual qualities that are unique to humans. (Aoun 2017: 53)

Thus, Aoun's (2017: 53) call for 'humanics' purports to draw on natural capacities for 'creativity and flexibility' to re-centre learners in the educational process, such that they are able to exact command over the growing swarm of intelligent machines. Even the afore mentioned report on the impact of machine learning in economics is careful to protect the centrality of human economists. The final sentence of the report reads:

> As ML [machine learning] automates some of the routine tasks of data analysis, it becomes all the more important for economists to maintain their expertise at the art of credible and impactful empirical work. (Athey 2018: 27)

This is perhaps no surprise, given that, as Peters (2018) suggests, recent terms such as the 'knowledge economy', 'cognitive capitalism', or 'knowledge capitalism' have all attempted to re-centre human capacities following industrialisation, not only ensuring a viable position for human workers, but also dictating the direction and scope of education.

Such ideas are well-established in pre-digital debates about the role of education in the rise of automation, framed by Moffatt and Rich (1957: 273) as 'social competence':

> Social competence, meaning ability to know what is occurring and to adjust one's actions to this rapidly changing society, would also appear to be a goal towards which much more effort in education is likely to be needed in these days. (Moffatt and Rich 1957: 273)

Indeed, the suggestion is that a future society is 'likely to put a premium on originative skill and imagination' (Moffatt and Rich 1957: 273), which appears remarkably similar to much more contemporary discussions of 'uniquely human' abilities required in the era of machine learning. Luckin et al. (2016: 47) warn that future jobs will be more 'cognitively demanding' where intelligent systems become more pervasive, and that students will need the 'higher order skills' of problem-solving. Future jobs will also require 'social skills', involving the 'ability to get on with others, to empathise and create a human connection' (Luckin et al. 2016: 47). There is a palpable determinism in these optimistic accounts that assume the straightforward ability to re-centre individuals as the drivers of socio-technical change. A much

deeper engagement with the philosophy of technology (for example Feenberg 1999) is needed here to understand the reciprocal and co-constitutive processes through which technologies and societies shape each other. One might argue, for example that the human ability to be 'creative' and 'flexible' *derives* from our already entangled relationships with technology, rather than being an innate, and exclusively human quality.

It is also worth noting that this definition and separation of human capacities is routinely presented as an opportunity to 'save time'; in other words, ostensibly, to complete work more quickly so that further leisure time is achieved. Once again, this is an engrained facet of the debates around technological unemployment, where suggestions that society may be on 'the threshold of an era of opportunity for wider and deeper cultural activity' (Moffatt and Rich 1957: 273) are commonplace. Media reporting on the advance of machine learning is awash with similar claims, such as the notion that the imminent application of machine learning will diminish 'the mundane duties that consume a teachers time', referring specifically to 'grading papers and tests' (Phillips 2018). As Luckin et al. (2016) suggest:

> Freedom from routine, time-consuming tasks will allow teachers to devote more of their energies to the creative and very human acts that provide the ingenuity and empathy needed to take learning to the next level. (Luckin et al. 2016: 31)

This liberation from drudgery is connected explicitly here with the ability to be authentically human, and thus to survive the intensifications of machine learning through genuine educational activity. However, more attention to the debates around labour- and time-saving technologies reveals cautions that apply equally to the era of intelligent machines. As Levy contends, 'technologies developed to make more time to think have seemingly had the opposite effect' (Levy 2007: 238). Luckin et al. (2016) call for, not only the comprehensive training of teachers, but also the wide-ranging deployment of machine learning in education would seem to imply significant additional professional commitments. Of course, further examination reveals that the suggestions of 'saving time' tend towards concerns for efficiency, rather than an actual diminishing of labour for teachers: 'where their time is used more effectively and efficiently, and where their expertise is better deployed, leveraged, and augmented' (Luckin et al. 2016: 11). Just as Levy (2007: 243) describes in an insightful historical account of the acceleration of modern life that the information age was merely 'the latest manifestation of a 'more-faster-better' philosophy of life', the era of machine learning appears to be portrayed as yet another technology of efficiency.

TEDx talks are another pertinent example of the ways academic research in machine learning is reformatted into mainstream material. These high-profile online resources largely adhere to a typical pattern that frames machine learning, or A.I., as a profound disruption, for which educational transformation provides a necessary solution. However, it is notable that these suggestions for the future of education often come from those much more invested in technological, rather than educational, development. Hirsch (2017) suggests that, following a certain future of universal disruption from machine learning, the identification and nurturing of 'specifically human' qual-

ities, including 'empathy', 'creativity' and 'critical thinking', is necessary to 'inoculate ourselves' against the rise of autonomous machines. Holman (2017) emphasises the notions of 'problem solving' and 'creativity' as exclusively human abilities, making direct associations with Abraham Maslow's concept of 'self-actualisation' (see Maslow 1943). Elsewhere the notion of 'STEMA' (science, technology, engineering, maths, and *the arts*, as opposed to the more established 'STEM') is advocated as a way of framing computer science learning in 'creative' terms (Meetoo 2016). In another prominent example, 'problem-based learning' is foregrounded, which tasks students with solving 'real world problems', explicitly framed as a way of counteracting the fears around technological development (Schindlholzer 2016).

In the rise of machine learning, education is often positioned as a foundational concern. The prospect of intelligent, and employable, machines motivates, not only serious questions about the purpose of education, but also the exceptionality of human beings, and both A.I. and education researchers appear concerned with the task of preserving the livelihood of future generations. However, what is particularly important to highlight in some of these influential, and very public discussions of the relationship between machine learning and education, is the way that specific disciplinary practices from the computer sciences are being translated into broad calls for educational reform. Particularly overt in the promotion of 'problem-solving' appears to be the influence of 'computational thinking'; a form of analysis used to design and evaluate technical systems (Wing 2008). The promise of a future in which skills associated with machine learning are supposedly indispensable for employment, is not only elevating disciplinary knowledge from the computer sciences, but also *ways of thinking*, which may have a profound impact on educational approaches.

'Problem Solvers' or 'Citizens'?

With a grounding in computing, 'computational thinking' is a form of analysis focused on solving technical problems through a process of abstraction: 'deciding what details we need to highlight and what details we can ignore' (Wing 2008). This definition highlights the particularly acute nature of this analytical technique, and the way in which it uses a reductionist modelling of the world that includes specific elements, while excluding others. What is crucial to highlight here is the way that such analytical thinking becomes 'hard-coded' into the technical systems that are subsequently developed. Machine learning is, of course, a key site where this underlying disciplinary practice is concretised into powerful and authoritative technologies. Jordan and Mitchell (2015) offer this example of the application of machine learning:

> in learning to detect credit card fraud, the task is to assign a label of 'fraud' or 'not fraud' to any given credit card transaction. The performance metric to be improved might be the accuracy of this fraud classifier, and the training experience might consist of a collection of historical credit card transactions, each labelled in retrospect as fraudulent or not. (Jordan and Mitchell 2015: 255)

While this perhaps is too specific an example to overly generalise about machine learning, it is clearly indicative of the 'computational thinking' disciplinary practice that is concerned, not only with abstraction, but also with a discrete ordering of phenomena. In other words, what is surely a much more messy and complex world of credit card fraud, is isolated into a simple model of 'fraud' or 'not fraud', in which conclusive decisions are made about what to 'highlight', and what to 'ignore'. While this technique might work very well to detect credit card fraud as described, one might argue that broader social issues cannot be classified in such a straightforward fashion. Furthermore, what this example of 'problem solving' also indicates, is the lack of attention given to the wider contexts in which fraud takes place. If the computationally minded problem solvers emerging from future education, as described above, are to direct all of their creative attention to developing such machine learning software, it would seem to leave little room for consideration of the underlying political, economic, and social conditions which produce and maintain systems of credit, as well as the attempts to deceive them.

At this point, it should be stressed that this is not a call to banish machine learning curricula, research, and development in favour of universal schools of critical thinking. Rather, it is to signal that the 'creative problem-solving' often advanced in the wake of machine learning can tend to be overly concerned with narrow sets of phenomena and a discrete modelling of the social world, that tends to disregard important overarching conditions, and complex situations that cannot necessarily be reduced to neat, mutually exclusive categorisations. To suggest that employed citizens of the future could also seek to find solutions to the reliance on credit, rather than participate exclusively in maintaining the system by discovering techniques for punishing transgressors, is, one hopes, not too radical a suggestion.

Indeed, Morozov's (2013) critical take on the Silicon Valley culture of 'solutionism' makes precisely this point, although directed much more broadly at technology development than machine learning specifically. In such a solutionist culture, the individual is tasked with solving worldly problems, however in the form of narrow technical 'fixes', that deflect attention away from viewing phenomena in terms of wider systematic, interconnected and interdependent, conditions. The concern with 'solutionism' here is the extent to which the 'problem-solving' analytical framework can, in practice, serve the broad intellectual agenda that one might wish to see maintained in education. As Morozov (2013) further suggests, such approaches to analysis depoliticise the individuals involved, who are encouraged to privatise the solution. What is important to highlight here, is not only the focused technical mode of analysis, but also the ease with which it is sequenced within a neoliberal and capitalist framework. 'Problem solving' seems, when directly aligned with the development of software 'solutions', to be positioned as an overt step towards commercialisation.

One might contend that the social world is not, in fact, a set of largely distinct 'problems-to-be-solved', but rather a much more complex multiplicity of congenial and compatible phenomena, irreducible to simple categorisation. In aggrandising the disruptive potential of machine learning Geoffrey Hinton suggests (Mukherjee 2017), '[t]ake any old classification problem where you have a lot of data, and it's going to be solved by deep learning'. This raises serious questions, not just about

whether education itself is a 'classification problem', but more pertinently, how it is being translated as such so that machine learning can be applied. As Aoun (2017: 62) acknowledges, aspects of human thinking are 'unquantifiable'. One needs to ask fairly general, but nonetheless vital questions here, such as, what is the value of defining 'learning' and 'not learning' as clear-cut, mutually exclusive conditions? And further, what kind of social world are we therefore assuming to exist, and making tangible through such software interventions? It is perhaps worth noting Moffatt and Rich's (1957: 269) pre-digital warning that those domains 'whose transactions do not lend themselves to standardization, could find automation completely without advantage'. The question of whether education is such a domain should be precisely the kind of critical debate that is developed with students.

What is crucial to underscore here is that 'creative problem solving', and its close cousin 'entrepreneurship', appear tightly aligned with particular technical disciplines, and therefore present a questionable model for general education. Moreover, the 'problem solving' agenda is overtly tied to the discourse of economic disruption that habitually accompanies the discussion of machine learning and A.I. systems. However, such calls, which as we have seen, often derive from invested advocates of technological development, assume the inevitability of extensive unemployment, and wide-ranging societal change. It is this fatalism that needs to be challenged, and for which a more substantial framing of education should play a vital role. Mass unemployment from machine learning is not inescapable. Rather, it is a particular vision of the future propagated the increasingly powerful technology sector, and one that is frequently used to justify educational reform. Promoting 'computational thinking' and 'problem solving' as broad educational practices, relevant across disciplines, would seem to abide by, rather than contest or challenge, this narrative.

Ideas related to critical thinking and citizenship are key ways to frame the project of education, beyond the simplistic alignment of machine learning, imminent job replacement, and the direct transfer of analytic techniques from the computer sciences to general education. While Aoun (2017: 63) specifies 'critical thinking' as one of the 'cognitive capacities' associated with 'humanics', it is a rather thin explanation of 'contextual analysis'. The examples provided include the advantages of using critical thinking for a social media company's marketing plan, and the solving of aeronautics and engineering problems, but very little that would seem to encourage engagement with the politics of machine learning and A.I. development (ibid). This is not to entirely dismiss Aoun's (2017) attempt at specifying a broad pedagogical programme for combining content knowledge with 'ways of thinking' appropriate to the age of intelligent machines, but rather to suggest a more in-depth kind of practice that engages with the purpose of education itself. Where Aoun's (2017: 66) 'cognitive capacities' include 'entrepreneurship', one can perceive 'humanics' as an attempt to maintain the political status quo of free markets, much more than an encouragement for 'ways of thinking' that might challenge it. Educational responses to the question of intelligent machines could be developed further in this area by connecting with recent sociological work related to notions of identity, politics, and citizenship as envisioned for a digital age (for example Isin and Ruppert 2015; Mccosker et al. 2016). In this way, rather than preserving machine learning as a *method* which is simply *applied*

to social problems, the project of education might look to interrogate the underlying 'world views' that accompany the elegant and efficient solutions of A.I. systems. The future needs much more than creative, entrepreneurial problem solvers are able to carve out ever more value and efficiency with the use of intelligent machines. The future needs engaged citizens who are able to understand and question the dominant technological and political landscapes, and are able to think them otherwise.

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Chapter 20
Towards Epistemic Health: On Stiegler, Education and the Era of Technological Unemployment

Mark Dawson

The Automated Generation

Throughout his career, the philosopher and cultural critic Bernhard Stiegler has repeatedly called for a re-evaluation of our relationships with technology. *Technics and Time, Volume 1* (Stiegler 1994) is perhaps the most well known of these calls, and one which expertly re-frames a much older conversation which calls for the deconstruction of the border between the concept of the human and its technological other. Performing a critical narrative which takes in Freud, Husserl, Heidegger, Leroi-Gourhan and Simondon amongst others, Stiegler calls for a repositioning of technics as the condition of both the individual and social individuation of the 'non-inhuman', as well the horizon against which any opposition between human and technical object can be deconstructed. Affirming a certain Derridean legacy in terms of his deconstructive reading of technology has not been without its critics,[1] but what Stiegler's work does offer, and more so as it has evolved, is a situating of that deconstructive approach to technology amongst three interrelated themes, all of which will be key to the following chapter: the increasingly rapid development of automation, the impact of digital technology on education, and the possibility of articulating both through a politics of care. In 'What is Called Caring?' (Stiegler 2017) and 'Automatic Society' (Stiegler 2016), for example, Stiegler suggests that a decline in our cognitive faculty is linked to the global banking crisis of 2007–8, the seemingly inexorable intensification of technological unemployment, and the entropic slow death of the Anthropocene. Indeed, in the latter's deference to 'algorithmic governmentality', we

[1] See (Bennington 1996). This is a particularly nuanced critique of Stiegler's engagement with both Derrida and Heidegger, and does much to suggest that, at the very least, Stiegler's urgency to respond to a certain crisis around the impact of techno-science comes at the cost of foreclosing the political space which it, paradoxically, attempts to guide us towards.

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can identify 'the thoroughly computational capitalism that is establishing an era of absolute non-knowledge' (Stiegler 2017: 8). Responding to work by Thomas Berns and Antoinette Rouvroy, Stiegler is putting the term 'algorithmic governmentality' to work as a description of a 'new kind of economy' which is based on 'personal data, cookies, metadata, tags and other tracking technologies' through which methods from applied mathematics are placed in the service of 'automated calculation' (Stiegler 2016: 1; Berns and Rouvroy 2013: 163–96). According to Stiegler, then, the two fundamental qualities that can be associated to this era of algorithmic governmentality are fully automated calculation and hyper-synchronisation.

If Stiegler is correct, and in the era of 'algorithmic governmentality' the once familiar concepts of work and employment are being made to tremble, then we are faced with complex concerns for Higher Education. Indeed, in 2010 Stiegler gave a fairly stark warning of the impact of the 'programming *industries*' on the teaching or 'programming *institutions*' [my emphasis], one which would question the latter's ability to form a generation of graduates who might survive such a clash:

> Today, the consequences of the conflict between programming institutions and programming industries is blindingly clear: teaching institutions are crumbling […] despite the fact that these intuitions and this culture exist precisely in order to form a new generation of non-inhuman beings. (Stiegler 2010: 183)

Stiegler's use of the term 'programme' is complex, in that is spans both the largely positive programming institutions and largely negative programming industries. This suggests that the programme can be configured as both remedy and poison (an indication of its pharmakological 'essence'; something to which I'll return below). In either sense, however, the programme is synonymous with what Abbinnett refers to as an 'integrated technological environment'. Indeed, Abbinnett succinctly summaries this when he suggests such an environment 'presupposes a grammatological medium that, for Stiegler, is constituted through the digital networks that encode the present state of social, political and biological reality' (Abbinnett 2018: 42). Stiegler's issue, then, is that the teaching or programming institutions are facing a crisis in that their ability to form graduates who might survive the impact of the programming industries, is waning. The outcome of this being 'a psychological and social disaster of which the overriding consequence is the liquidation of our cognitive faculty, and its replacement by informational dexterity' (Stiegler 2010: 183).

In the later work, *Automatic Society* (Stiegler 2015), a text which considers the effects of automation on society and culture, and which asks to what extent the very notion of society is still possible in such an automated era, Stiegler further maps the effects of large-scale reticulated networked technologies (the programming *industries*) on a generation formed *within* what Ross Abbinnett calls 'the systems of virtual-informatic exchange' (Abbinnett 2018: 182):

> In automatic society, those digital networks referred to as 'social' channel [behavioural expressions] by subordinating them to mandatory protocols, to which psychic individuals bend because they are drawn to do so through what is referred to as the *network effect*, which, with the addition of *social networking*, becomes an *automated herd* effect, that is, one that is highly mimetic. (Stiegler 2016: 36)

In a footnote to this, Stiegler describes the network effect as 'an economic mechanism of positive externality, as a result of which the value of goods of services depends on the number of other users' (Stiegler 2016: 261), with the telephone network being the most obvious example. For Stiegler, the network effect is key in the conditioning of an *automated* generation who can be remotely controlled by the same networks to which they contribute. It is worth citing Stiegler at length here as he maps the process by which this works:

> Through the network effect, through the artificial crowds that it creates (more than a billion psychic individuals on Facebook), and through the crowdsourcing that it can exploit through 'big data', it is possible:
>
> - *to generate the production and self- and auto- capture* by individuals of those tertiary retentions that are 'personal data', spatializing their psychosocial temporalities;
> - *to intervene in the processes of transindividuation* that are woven between them by using this 'personal data' at the speed of light via circuits that are formed automatically and *performatively*;
> - through these circuits, and through the collective secondary retentions that they form automatically, and no longer transindividually, *to intervene in return, and almost immediately, on psychic secondary retentions*, which is also to say, on protentions, expectations and ultimately personal behaviour: is thus becomes possible *to remotely control, one by one*, the members of a network – this is so-called 'personalisation' – while subjecting them to mimetic and 'viral' processes of a kind never before seen. (Stiegler 2016: 37–8)

It seems vital that our teaching or programming institutions should at the very least be intervening in, and questioning, the processes outlined above. Yet, those institutions seem ill-equipped to undertake such a task, not least because the operations of the programming industries work at the 'speed of light' or 'almost immediately'; speeds which the programming institutions will never, and perhaps *should* never, be capable of outpacing.

The process by which this automation occurs can perhaps be thought of as the colonisation of the processes which form memory and consciousness, processes which, as the work done to deconstruct Husserl has shown, always requires some level of technological/prosthetic support. This support is what Stiegler refers to as 'tertiary retention', which, somewhat counterintuitively, precedes primary and secondary retention as the condition of memory formation. The familiar example is the requirement that music be either recorded, or recordable, in order to experience, store and retrieve it as memory; it thus requires some form of technological or prosthetic support, even if that support is merely the differentiated language of musical notation. For Stiegler, this process has been hijacked on an industrial scale by the reticulated programming industries; a process we continue to support by 'spatializing' our psychosocial temporalities, that is, by playing out the majority of our lives by documenting, constructing and contributing our 'personal data' to digitally networked communication platforms. By offering or suggesting ideas, memories, futures, relations and histories, such platforms now condition the economies of thought and behaviour through which we now live our lives:

> '[s]elf-produced in the form of personal data, transformed automatically and in real time into circuits of transindividuation, these digital tertiary retentions short-circuit every process of *noetic différance*, that is, every process of collective individuation conforming to relational, intergenerational and transgenerational knowledge of all kinds'. (Stiegler 2016: 38)[2]

We are, therefore, at something that I hesitate to call a generational divide, or one between native and immigrant, but which is nevertheless a divide on some epistemic level, namely that between those who have been born into the economies of behaviour described above (what we might describe as an 'automated generation') and one which Abbinnett describes as being formed within the 'analogical programme'. What is more, for Abbinnett, the divide between these two epistemic eras is increasingly resentful:

> a certain contempt has arisen between the generations which is based on the dislocation of two forms of knowledge: the media-technological proficiency of those who have grown up within the systems of viritual-informatic exchange, and the orthographic-historical culture of those whose cultural memory has been formed by the analogical programme (primarily film and television). (Abbinnett 2018: 182)

Though this epistemic divide may be becoming less and less pronounced the further we move away from a certain analogical era, it is not something which can be remedied by a return to the analogue. Indeed, the influence of the programming industries which Stiegler describes above really took hold in the analogue era, with such a process probably best described by Max Horkheimer and Theodor Adorno's chapter 'The Culture Industry: Enlightenment as Mass Deception' in the *Dialectic of Enlightenment*. Here they suggest that 'the whole world is passed through the filter of the culture industry', where even 'the most intimate reactions of human beings have become so entirely reified, even to themselves, that the idea of anything peculiar to them survives only in extreme abstraction'(Horkheimer and Adorno 2002: 136).

Stiegler, however, and as Ben Roberts succinctly notes, reconfigures the position of technology in Horkheimer and Adorno's analysis from that which is subordinate to economic and social forces, to a that which must be considered at a more profound level.

> By subordinating technical evolution to the rationale of economic and social power, technology [in Horkheimer and Adorno's analysis] is understood in classical fashion as a means to an end, as a tool fashioned and directed by an intention that lies outside of it. The question of technology is thus displaced by socio-economic analysis. However, it is just this understanding of technology that Stiegler's whole project seeks to challenge. Stiegler situates the problem of industrialization at the level of tertiary memory and not at the level of culture. (Roberts 2006: 61)

This albeit hasty detour through Horkheimer and Adorno's project may allow us to elaborate a little on Stiegler's contention that the programming institutions are

[2]In using the term *différance* here, Stiegler is recalling his work's intimate relationship with that of Jacques Derrida. Stiegler uses this term in this context as something similar to a grammatological network or arche-programme through which all noetic life is inscribed. Interestingly, in a footnote Stiegler suggests that *noetic différance* 'is not limited […] to the intellectual and spiritual life that metaphysics opposes to sensible, working and social life.' (Stiegler 2016: 262, Footnote 86). Rather, *noetic différance* would be the condition for deconstructing the borders between such terms.

crumbling in the face of their more industrial counterparts. If this is a question of a relation to knowledge formation, and if knowledge for the automated generation is something which is conditioned by an ever more powerful and ever more pervasive programming industry, then we are presented with a significant double bind in which the institutions that should be trying to understand the questions posed by industrial-scale automation, are *at the same time* subject to the automated processes which could make that understanding impossible. How, for example, might universities prepare their students for a possible future in which algorithmically driven applications of digital technologies could destroy more jobs than they create, when the very processes, people and structures for thinking such a future are themselves being subsumed by the programming industries? This is a question, then, of rebuilding the possibilities of thinking and of forming knowledge, but not from a position before or outside of the reticulated digital technologies which the programming industries so effectively put to work. Rather, we must carry out such a task from within the very conditions which make those industries so pervasive. It is only at this point that we can begin to think the place of the automated generation, in an era of automation.

It is important to remember that, in considering the notion of an 'automatic society', Stiegler is thinking the notion of the 'social' alongside the 'automatic'; his question, then, is: 'If society is what deliberates, and if algorithmic automatisms outstrip the possibility of such deliberation, then in what conditions is an automatic society still possible? (Stiegler 2016: 231). Interestingly, and as he goes on to suggest, such conditions remain in a certain proximity to the very market through which the social seems to be eroding:

> Our answer is simple: [automatic society] *is possible only above and beyond the market* – the latter constituting what Augustinian Rome called *negotium*. It is only *above and beyond* the market (which is not to say *against* it) that it is possible to place automatisms in the service of reason, that is, of decision, and therefore of individual time in its participation in the formation of a time that would be historical and political – that is, awaited expectantly, projected collectively and neganthropic. (Stiegler 2016: 231)

As Daniel Ross summarises, Stiegler's notion of the *neg*anthropocene signifies a response to the increasingly apocalyptic economies of the Anthropocene. It 'aims to establish what the Anthropocene should become, 'transvalued' by the Neganthropocene, thereby opening both a new epistemic era for noetic forms of life (against the de-noetization currently underway) and the possibility of a contributory economy founded on this new *epistēmē*' (Stiegler 2017: Footnote 3). For Stiegler, the 'Anthropocene is an "Entropocene", that is, a period in which entropy is produced on a massive scale, thanks precisely to the fact that what has been liquidated and automated is knowledge, *so that in fact it is no longer knowledge at all*, but rather a set of closed systems, that is, entropic systems'. (Stiegler 2018: 51). Counter to this, he suggests that because knowledge is always an 'open-system', 'it always includes a capacity for dis-automization that produces negentropy'. (Stiegler 2018: 51–2). In this sense, therefore, a 'neganthropologic' response to automation would require a position or starting point which somehow both exceeds *but remains in direct proximity to*, the market-led technologies which are currently trying to automate, and thus

liquidate knowledge, but one which would also embrace the capacity for knowledge to remain resistant to such operations.

Such a manoeuvre, then, would put the essentially 'pharmakological' nature of technology to work in order to reverse its negative/entropic direction through an engagement with knowledge that affirms its inherently *neg*entropic potential to disautomate. The *phármakon* is a notion which suggests technology is at once both remedy and poison, a suggestion which Stiegler has continued to affirm throughout his work, and which owes much to the work of Jacques Derrida, and to his deconstruction of the privileging, from at least Plato on, of speech over writing. As Derrida has demonstrated, the orthographic technique of writing was described by Plato as always-already supplementary to a more pure speech. By referring to this technological supplementing of speech as the *phármakon*, however, Plato revealed an impossibility in deciding once and for all as to the place, primacy and ontological status of technology. Indeed, in Plato's work, writing as *phármakon* is considered both remedy for, and poisoning of, the ideality of speech (Derrida 1981). This inherently double-edged nature of the technological supplement carries on through into Stiegler's work in that he suggests all our endeavours must be trained towards steering technology towards its more positive/remedial/therapeutic and *neg*entropic qualities, as opposed to the more poisonous aspects outlined above. Due to the limits of this paper, this description of the *phármakon* gives an admittedly simplistic insight into Stiegler's engagement with the term. It does, however, go some way to indicate how Stiegler's suggested remedy to the negative/entropic aspects of technological innovation can, and indeed *must*, remain so close to ubiquitous digital platforms and subsequent algorithmic governance which, for Stiegler, are the conditions of our ruin. We can see then, how the 'answer' goes above and beyond the market, whilst remaining in its vicinity.

One particularly practical example of this theoretical manoeuvre, is the work Stiegler, amongst others, has undertaken as part of the Plaine Commune project (Plaine Commune 2013). The latter is an *Établissement public territorial*, or 'Public Territorial Institution', of which there are currently 12 in France. The Plaine Commune consists of nine districts in the department of Seine Saint Denis, was established in 2000, and is described by the Seine Saint Denis tourism website as an 'inter-municipal corporation' whereby each participating district contributes public services towards the joint management of the EPT (Comité Départemental du Tourisme 2001). For Stiegler and Ars Industrialis (the international collective of thinkers, workers, educators and activists which he founded in 2005), the Plaine Commune presents an opportunity to embed into practice some of the solutions he has long suggested in theory. In terms of this paper, the project has particular interest due to Stiegler's attempt to establish via the Plaine Commune something which might resemble a 'contributory economy', and as part of that a *putting to work of automation* as that which can begin to reverse some of the negative effects of algorithmic governance, notably, the eradication of the social and the associated rise in technological unemployment. I will argue that such a task is intimately related to what I call 'epistemic health', the latter being the very thing which is at stake with the increasing shift to automation. I want to suggest that Stiegler's approach shows why,

and suggests how, higher education institutions can play an active role in steering the inexorable increase in automation towards a more epistemologically healthy direction. Because an increase in *artificially intelligent* automation is premised upon a shift in the question, formation and evolution of knowledge, a primary battleground for both the question and impact of technological unemployment are educational institutions (or the programming institutions to use Stiegler's term). I will argue that such institutions can only have a positive influence on this question if the care for knowledge and deliberation which they embody is extended beyond the traditional borders of the campus, but that this can only be achieved through a certain reconfiguration of the networks through which hyper-industrial automation is deployed.

Re-Territorialising the Network

In a lecture entitled 'Governing Towards the Neganthropocene', given in Kochi in 2016, Stiegler gives what is perhaps the most relevant explanation of how his hopes for the Plaine Commune converge with the attempt to respond to algorithmic governmentality, and algorithmic culture in general. In this paper he also signals what I want to argue is a very practical framework for how higher education institutions might engage with a network of organisations in order to help them think through, and in some sense, battle against, the regional impact of technological unemployment. It is, therefore, worth spending some time with this text. In opening the paper Stiegler reminds us that the etymology of the word 'govern', comes from the Greek, *kubernan*, which means to steer, turn or drive (in the sense of controlling a rudder to steer a boat). He goes on to note that *kubernan* is also at the origin of 'cyber', in the sense of cybernetics as a science of electronic and/or automated decision-making and/or control. Stiegler plays on this association, aligning the metaphor of steering a boat with that of governing or steering an organisation. In this analogy the boat represents the possibility of governance as the enacting of the decision of a person or crew to go in one direction of another. In a sense, then, this represents a certain capacity for decision-making obtained through the 'human' interaction with technological objects, with the conditions for such decision-making being the constantly changing world through which we must 'navigate'. Stiegler's current concern, then, in terms of governing and decision-making, is that we now find ourselves in the midst of a particularly disruptive era of the Anthropocene, one that began with public access to the Web in the spring of 1993. Such an era brings with it a particular shift in the capacity to think for oneself, and a subsequent disorientation 'the lived experience of which is like a storm carrying populations along with it, as if borne along in rudderless vessels' (Stiegler 2018: 117).

Stiegler describes this era as one in which we lack the tools to navigate the storm of disruption, an era in which those who would have once made decisions and/or governed have essentially become rudderless. The political outcome of this is the relatively recent turn to what the media might describe as populist, nationalist, nativist and protectionist thought, and to events such as Brexit and Trump. What is crucial

to note, however, is how Stiegler aligns the displacement of decision-making with the ongoing displacement of work, in that in both senses the activity shifts towards an industrial-scale automation enabled through reticulated digital technologies. This *cybernetic* age of disruption, then, 'is radically transforming the *instrumental conditions* of decision-making, just as it is radically transforming the *future of work*—in the context of a massive decline in employment due to the effects of automation, which will have immense macroeconomic consequences on a planetary scale' (Stiegler 2018: 117). The automated generation, as outlined above, are also the generation who will experience this decline in employment, resulting in a ruinous race to the bottom whereby the gaps produced by an inability to steer oneself in the storm of disruption is filled by a networked series of platforms which are more than willing to do it for you.

Stiegler's aim is to break this cycle with 'a surge or boost of reason and therefore of responsibility' and which calls for public and private institutions to 'completely recompose their fundamental relations *at the regional scale*, and […] in the service of new *local pacts* capable of constituting a *contributory society* and through which a new era can be established' (Stiegler 2018: 117). His project in Plaine Commune attempts to do this through what appears to be a process of re-territorialisation, that is, the reinstating at a regional scale a certain spirit of authority, a spirit which the present disruptive/cybernetic/automated era is rapidly eroding:

> Before our present disruptive age, territorial exosomatic growth, whether in the form of a city, a metropolis or a village, territorialized an *authority*. Such *authorized* exosomatic growth localized a spirit, a soul – a sense of place, an *espirit des lieux* […] animated by a soul itself founded on a diversely symbolized history, more or less monumentalized, and more or less ancient. (Stiegler 2018: 121)

Readers familiar with Stiegler's poststructuralist inheritance may be a little concerned with this attempt to reinscribe a notion of spirit as the scene of authority. Stiegler's response to this is long and complex, and spans almost the entirety of his work on the negative possibilities of digital and networked technologies. It is, therefore, beyond the scope of this paper to take up that theme in the detail which it requires. That said, he succinctly sums up the fundamental reason for re-engaging with the notion of spirit in a way which echoes Derrida's work on the *revenant* as a certain radical alterity which *returns* from the future as that future's very possibility. Stiegler articulates and echoes the dependence of thinking upon such otherness when he suggests that the notion of spirit remains a possibility of a future which exceeds the calculability—and calculable future—upon which automation and hyper-industrial capitalism rely:

> Without in any way denying the *seriousness* of this or that perspective tying the word spirit to the totalitarian perspective on totality, and without wanting to deny what muting it, so to speak, gave to the laicization that was enshrined in the secularization of the origins of capitalism, I think that what constitutes the fundamental principle of the *liquidation* of the concept of spirit is that the *spirit is that which returns as the incalculable*, and as the ghost of the incalculable, whereas capitalism, as Max Weber said very early on (not long after Nietzsche), is what must eliminate the incalculable – which it does even at the risk of eliminating itself. (Stiegler 2018: 68–9)

If the re-territorialising of spirit is the possibility of authority, then Stiegler is also re-territorialising a space beyond calculability; a space to deliberate and think with the other in order to work towards a notion of reason and responsibility which cannot be automated in advance. I would argue that everything Stiegler is working towards in the Plaine Commune resembles, at a certain level, this attempt to reinstall places and spaces to think, deliberate and decide upon that which must remain to a certain extent undecidable or incalculable. This process of *dis*-automation, as the possibility of thinking and deciding for oneself, is, therefore, also the very condition of democracy.

So how does Stiegler suggest we begin this process of *dis*-automation as re-territorialisation? The answer is, somewhat paradoxically, in putting automation to work by redrawing the intersections of the technical and social systems as embodied by businesses and organisations, as well as by the public and private institutions through which we live out our everyday lives. It is only by doing this, he argues, that we would approach anything that might resemble the spaces which are being referred to as 'smart':

> This more intelligent, truly intelligent, 'really smart' city must seize hold of automated processes, above all in order to prescribe boundaries, performance characteristics, functional characteristics, in order, in other words, to undertake territorial *design*. This is possible only on the condition of arranging the various processes of psychic and collective individuation among themselves via technical individuation. That is: by conceiving a *territorial reticulation* capable of reconstructing a *territorial dynamic* that produces a *sense of place* [*espirit des lieux*] and a *positive local animation*, in a context where it is also and perhaps especially a matter of rethinking the relations between work and society at a moment when employment is in irreversible decline. (Stiegler 2018: 122–3)

The process of territorialisation that Stiegler outlines here rely on the linking of three important terms: design, reticulation and animation. This is a process which requires the design of networks as the re-inscription of a territory as the possibility of both place and a certain 'local animation'. Animation is an important term to note, in that it performs an operation which seems to summarise Stiegler's approach; as *anima* means both life and breath, a 'positive local animation' would be a certain act of revivification the condition of which would be the specifically designed reticulated territories. The re-territorialised network would now *install* the sense of place which the era of automation and algorithmic governmentality has extracted. In other words, Stiegler has seized the inherently pharmakological nature of reticulated digital technologies—in that they are always potentially both poisonous *and* remedial—and put it to work by emphasising its positive potential as a way to combat the negative sense we outlined above.[3]

[3]It is also worth noting that at the heart of animation is a certain automatic process. Animation is never free from automation and is indeed perhaps best described as the putting to work of automatic processes to resemble something which acts *as if* it is free from those processes. Stiegler comes close to this when he discusses Félix Guattari's notion of the machinic unconscious 'as that which does not elaborate on the reverie that accompanies this kind of enslavement', but a reverie which is nonetheless 'always at the origin of thinking that goes off the beaten track'; a certain mode of dis-automization. See Stiegler (2016: 126).

Earlier in the paper, Stiegler had discussed how the 'traditional' spaces of the city were inscribed as points where technical and social systems intertwine. By unpacking how this process of territorialisation has historically occurred, I would argue that he also begins to map some of the points where it might be possible to intervene:

> The city, as an exorganic landscape forming a local authority, itself supports those exorganic processes of individuation that are businesses and corporations. The latter are, as it were, outgrowths of the territory, formed between the technical system, which is 'embodied', so to speak, by those businesses and corporations, which are the concretion and stabilization of technical individuation processes, and the social systems – systems of education, language, taxation and so on, and obviously the law and especially the law and right of citizenship – which are specific forms of psychic and collective individuation. (Stiegler 2018: 122)

In suggesting that within the re-territorialised spaces of the city, it is the businesses and corporations where we find individual and collective individuation as an interweaving of technical and social systems, Stiegler is also highlighting points of contact between education and technology which, up until now, have largely been confined within the borders of the University. I want to argue that it is at this level that tertiary level education can start to become effective in articulating points at which the process of dis-automation can operate up and against those of automation. As Stiegler asks what is now becoming of this space in the era of the 'automatic city', he also calls for the 'truly intelligent city' and the reversal of the negative dynamic brought in by the era of algorithmic governmentality. Although the intersection of technical and social systems remains articulated by business and institutions, for the automated generation most of this interaction has moved into online space, and therefore also into an increasingly automated and algorithmically controlled space. The point, however, is to remap such interactions as part of the territorial design process, in turn identifying points at which an intervention is possible in the reticulated digital networks through which psychic and collective individuation is inscribed.

Stiegler suggests that the Plaine Commune had been conceived as a re-territorialisation of both physical and virtual spaces in an attempt to create what he terms a 'territory of reference […] where all the actors this involves will want to learn along with the territory, at the same time that they teach it' (Stiegler 2018: 123). This act of symbiotic inscription is an experience of learning and teaching which intersects with the processes of remapping the network. It is essential, however, that these processes work up and against the deterritorialization which is occurring as a direct result of the shift to platform-based interaction:

> There are, as we said, all kinds of exorganisms: boats, businesses, companies and factories […] political organizations and regional administrations at differing levels and represented by symbols or institutional buildings or monuments. Today, the relations between all these exorganisms are ever more subject to deterritorialized exorganisms, also called platforms, founded on the technology of cloud computing, global, purely reticular technology that makes possible new forms of control. (Stiegler 2018: 124)

At this point, Stiegler is a little unclear as to whether the territorialisation of the Plaine Commune is one which utilises this infrastructure as it stands, or rethinks it

completely. Indeed, this ambivalence is telling as it appears to be an amalgamation of both approaches which would be most effective:

> It is undoubtedly a question of grafting onto this apparatus [that this, the reticulated platform technologies]. But it may indeed be equally necessary to reimagine all of this, and to do so technologically, economically and politically. (Stiegler 2018: 124)

The process of re-territorialisation, then, is one which utilises the reticulated networks of platform capitalism in order to reimagine or reinscribe those networks as spaces where thinking can occur. This requires, 'at every level, the arrangement between automatons and processes of dis-automization' (Stiegler 2018: 126), where the latter resembles the design and installation of time and space to deliberate, to reason and to think.

Discussion

Stiegler's response to the question of algorithmically driven technological unemployment is at once quite simple and quite complex. It spans a familiar—at least since Marx—de-coupling of work and employment, or alienated labour and actual work, as well as the notion of a contributory economy which at once takes in a re-reading of a Foucauldian biopolitics, Freudian libidinal dynamics and a detour through the alternate economies of Bataille. What is new for those familiar with these themes, however, is that underpinning all of this is the necessity to re-formulate our relations with the tertiary retentions through which our exteriorisations as individual and social entities is performed. In other words, Stiegler calls for a reconfiguring of our relations to the digital networks through which we live our lives. This is the condition for turning the increasingly negative direction of the Anthropocene towards a Neganthropic re-affirmation of *différance* as the condition of a new *episteme*; one beyond that in which we are now living, and which is enacted via the calculability and hyper-synchronisation perfected by the reticulated networks of platform capitalism. Stiegler outlines this position through an ontological reading of the Anthropocene which is itself intriguingly negentropic:

> The singularity of the Anthropocene as an organological epoch lies in the fact it has generated the organological question itself, hence in the fact it is constituted by its own recognition, a recognition bringing with it something new: its negative protention and the necessity of overcoming itself. The *question* of the Anthropocene is how to *exit* from the Anthropocene qua toxic period in order to enter into a new epoch that we are calling the Neganthropocene, as a curative, care-ful epoch. In practical terms this means that, *on the economic plane*, *value accumulation should be undertaken exclusively with a view to neganthropic investments.* (Stiegler 2018: 45)

What I have drawn out in this chapter is Stiegler's blueprint for an infrastructure upon which such a re-evaluation of value can occur. If the Anthropocene is constituted by a recognition of its own limits, as Stielger suggests, then it is structured by a promise of something other than itself, something which remains incalculable but

which is nevertheless a certain promise of the future. This would suggest the new epoch of the Neganthropocene would require a knowledge economy which exceeds that which merely recompenses calculable outcomes, and is thereby perfectible by the fully automated processes of algorithmic culture. Instead, work must be valued as a form of knowledge creation which is, *fundamentally*, a relation to the incalculable as the promise of the future. I have argued that it is at this point where the pedagogical fibre of the HEI can become an exemplar of such knowledge formation, but that to be effective such practices must be woven into a process of re-territorialisation which takes in, but also exceeds, the boundaries and networks of the University.

One of the more immediate ways in which this process of re-territorialisation might begin would be to reconfigure the University as pollinator of the territories in which they are embedded, and to do this by installing/inscribing into the networks in which we live the space and time to consider, deliberate and decide as the capacity to reason with the other, and with it the very condition of the social. Although most universities have what might be seen as similar aims firmly embedded in their strategic plans, primarily in terms of linking academic research and innovation with external, private-sector entities, the difference, in this case, would be a refocusing of such aims through the pedagogical practices and principles of the institution. Which is to say that this is not just a case of leveraging academic research and innovation to increase or sustain profit and/or productivity, but also of leveraging a pedagogic approach which would inscribe a practice of learning and teaching as the condition for rethinking what profit and productivity actually mean. In this sense, the more progressive pedagogical concepts which we seek to achieve in the traditional spaces of the university—active, social, collaborative, dialogic peer-to-peer learning for example—are put to work as methods by which re-territorialisation occurs, at the intersections where institutions and organisations entwine in both physical and virtual space, and at the level of systems, processes and practice. In turn, such pedagogical methods become filters for choosing how and where automation is either encouraged or avoided. It is in this space, and at this level, that technological (un)employment can be negotiated *alongside* the creation of the social, as opposed to being the condition of its ruin.

What I've described above requires partnerships between several entities, some of which may have radically different outlooks, ambitions and intentions. But what use is critical emancipatory education if it remains confined to the seminars, conference rooms or even virtual spaces of a relatively privileged and highly educated class? These interventions carry no weight with the warehouse or call centre worker who is about to lose their job due to the impact of automation, and who, unfortunately, are unlikely to seek the answer to such a dilemma in higher or further education. At the same time what future is there for an organisation whose strategy eventually contributes to the death of a potential to produce difference; whether the production is that of objects, relationships, art, data or knowledge. The endpoint of this is an increasingly small elite and an increasingly large—or to use Stiegler's term, gener-

alised—proletariat. If profit is your thing, then it will shrink *along with* the social, not because of it.

Conclusion: Towards Epistemic Health

If something like a contributory economy, platform cooperative or universal basic income is the answer to technological unemployment, then we have to start forming the ecosystem in which such economies may function, and that is one in which people have time and space to reason and to think with or without one another in such a way which isn't determined in advance. Where they are prompted to do so (perhaps automatically) by the systems and networks in which they are inscribed, and which links them to the groups, councils, communities or institutions in which they can participate or draw further support or knowledge before taking that next step, decision or choice. Such prompts have to be *designed into* our daily lives, and embedded through a partnership of *socially committed* businesses, institutions and organisations. As ambitious as all this may sound, I want to suggest that projects like the Platform Cooperative Consortium are beginning to establish the ecosystem within which such re-territorialisation can occur. Again, and as Stiegler suggests, this is a process of *grafting* onto existing networks of reticulated technologies, in order to completely rebuild them.

What such initiatives do seem to lack, however, is a pedagogical focus, and one which centres on the epistemic health of those who participate in the networks with which they interact; something which employs a therapeutics of thinking as the careful co-creation of the territories which inhabit. It is worth noting here that Stiegler also makes the point that the French word *penser* (to think) has for some time been synonymous with *panser* (to care). In this sense, 'to think would always be to exert therapeutic activity' (see Stiegler 2017), and what I refer to as epistemic health would stand for a certain care which is taken over every meaningful interaction and/or relationship, a care which certain pedagogical practices have at their heart. As a pedagogy and a community of 'researcher-practitioners', the area of networked learning seems to me to be a space in which this can be explored, as well as a space where we can begin thinking through the processes of re-territorialisation outlined above. As Peter Goodyear notes 'a distinguishing feature of research and practice in networked learning is a shared commitment to critical and emancipatory forms of scholarship and education' which is constituted by 'complex entanglements of people, technologies, ideas, emotions, and know-how' (Dohn et al. 2018: 213). Indeed, Goodyear's own work on 'epistemic fluency' has suggested that an increased interest in the term 'epistemic' suggests a certain anxiety over the status of knowledge in a 'post-truth' world (Goodyear and Markauskaite 2018). To promote epistemic health in such a world, would be to maintain a critical relationship to knowledge, a certain caring *for* knowledge which academic intuitions—for the moment at least—remain responsible.

If this is to be successful, however, such an approach must reposition the principals of networked learning (which include: collaboration, dialogue and a non-hierarchical pedagogy aimed at the consistencies of social justice) as the method of performing such interventions at the edges and extremes of the networks where automation and algorithmic culture intertwine with the experience of everyday life.[4] This requires an extension of the communities of researcher-practitioners which Goodyear refers to, to take in the institutions, organisations and individuals who populate the locales, districts and municipalities in which they are inscribed, and an intention to mediate complex, seemingly infinite, and often profitable networks with interventions which might complicate, question and hold such networks to account. Stiegler's work is unique in offering not only a theoretical framework for mapping the genealogy and impact of an increased shift to automation, but also one which leverages technology's 'essentially' pharmakological nature to offer a practical and pragmatic response. This paper has begun to explore this response in the specific context of higher education, and suggested certain angles at which the programming *institutions* can influence the programming *industries* to mitigate some of the more negative outcomes of industrial-scale automation. Higher education institutions seem ideally placed to leverage existing relations between academic, private and third sector communities to intervene in these processes and begin to embed epistemic health as a key principle in the co-creation of technologically 'smart' societies, and if a certain concept of work remains part of, or essential to this idea of the social, then what might seem like risky or lofty ambitions, become imperative to the survival of such institutions, as well as for the regions in which they operate.

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[4] A 2018 piece in the Financial Times describes a new frontier or 'edge' for a distributed or de-centred AI which would be more economically viable, and therefore more profitable. At the same time such an 'architectural shift' can also be the point at which re-territorialisation can occur: https://www.ft.com/content/1dba534a-5857-11e8-bdb7-f6677d2e1ce8?list=intlhomepage.

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Chapter 21
Education as Utopian Method: Reimagining Education for a Post-alienated Labor World

Michael T. Hayes

Introduction

What would education be like in a world without alienated labor? The question brings together a wide range of intellectual interests from the field of education to the nature of work and the economy, the imagination, politics, and democracy. At stake is a future, maybe not one I will see, but it is one I can begin to imagine and work toward given the fact that such a question can be asked in earnest at this particular moment in history. In this chapter, I am much less concerned with the actual practice of education, and more focused on how education is imagined for the future.

The question begins with an assumption that has guided much thinking and research in education. The economy and how it operates exerts a powerful influence on the type and kind of education that might be found at a given moment in history. One of the strongest threads in this intellectual tradition is that contemporary education emerged as an institution supporting the capitalist relations of production preparing people for the social realities of a capitalist labor market. A seminal text in this trajectory is Bowles and Gintis' (1976) *Schooling in Capitalist America: Education reform and the contradictions of economic life*. For Bowles and Gintis, schooling has developed as an institution of social reproduction: socializing a population to be cogs in the capitalist economic machinery by creating compliant workers who are slotted and sorted into a world of alienated labor.

For Marx, alienation is when people become estranged from their own humanity as they lose the power to define and control their life destiny. This occurs in capitalism when people are defined as an economic entity, a 'worker', that is merely a replaceable cog in the economic machinery, and their worth is defined only in how well they maximize their surplus value (Dahms 2006). As workers in the capitalist machinery, people are disconnected from the products they produce, from the system in which

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they are forced to work, and from the other workers in the system. Their humanity, that is, their ability to direct their lives, is removed.

Alienation is the root of Bowles and Gintis' correspondence theory in which schools run parallel to the conditions of a capitalist economy. Within a capitalist economic system, the expansive idea of education got pared down to a system of 'schools' that simply mirrored the kinds of social relations found in a capitalist economy (Morrow and Torres 1995). It was a particular kind of economy that had determined the specific structure that education had taken. In fact, instead of education, we were left with schools. In the early part of the twentieth century, the factory dominated the economic landscape. The factory automated economic production to create a uniform product, and automation and uniformity became the focus of Education. A predetermined curriculum automated the educational experience to produce uniform student outcomes. The work and the cultural conditions of the school mimicked the kind of work and cultural conditions found in the factory (Dolby et al. 2004; Willis 1977). Simply put, the economy exerts a powerful influence on what education looks like and how it operates.

The question of what education would look like and how it would operate in a future economy that did not include alienated labor requires a speculative and imaginative approach to examine and understand that which is not yet. The purpose of this chapter is to engage in an imaginative inquiry into what a post-alienated economy could look like and then, extrapolate how an education could possibly operate in that system. By engaging in an imaginative poetic design, the goal is less about objectively describing what a future reality might be and more to imagining the contours of a possibility that harnesses the tension between what I would like to see become reality and what I believe are the limits to that thinking. While I will engage in the production of an educational utopia, it is within the context of a critical intellectual tradition that can be caught in the contradictions between a cynical view of the possibility for social transformation and the hope for liberation.

The road map for this chapter includes two elements: The first is examining and determining the extent of an economy that would create a post-alienated labor world, and second, it is conceptualizing an educational utopia as a method of inquiry. In the first part, I will argue that the automation initiated with the factory will advance to a point where a human component in the production process is greatly reduced. I will then assume that the reduction in labor demand will require less need for the economy to determine and control education to generate a uniform outcome. Second, I will lay out the terrain for an educational utopia as a method. Rather than thinking of utopia as an image, we should work toward, we should be constantly engaged in the imaginative design of a multiplicity of educational possibilities.

A Post-alienated Work Economy

> The communist economy, where nobody has one exclusive sphere of activity but each can become accomplished in any branch he wishes, society regulates the general production and

> thus makes it possible for me to do one thing today and another tomorrow, to hunt in the morning, to fish in the afternoon, rear cattle in the evening and criticize after dinner, just as I have a mind, without ever becoming hunter, fisherman, herdsman or critic. (Karl Marx, German ideology, 1845)

One of the core tenets of Marxist social theory is that capitalism has forced people into an alienated form of labor. The understanding of education as a tool of social reproduction and social control has always rested on the idea that a capitalist economy required workers that were uniformly productive and compliant (Bourdieu and Passeron 1977; Macris 2011). It was an economy that treated humans as another resource, an input into the system of production. Human labor as a kind of manageable resource was an absolute requirement for effective and efficient running of the economy. Sure, certain segments of the economy would see job losses because of automation, but those loses could be reabsorbed as other segments of the economy expanded. For example, automation created a drastic reduction in the need for human labor in factory production and factory workers were forced out of their jobs, which was offset by the expansion of a service-based economy. Service jobs replaced factory jobs (Srnicek and Williams 2016). More recent conceptualizations of a future economy based on contemporary trends suggest a more fundamental withering of the demand for human labor.

What seems to make the current wave of technological innovation different so that the economy may not be able to subsume displaced workers is artificial intelligence (AI). While we have grown accustomed to certain less skilled jobs being automated, such as factory work, agriculture, mining and quite soon, driving, some areas were considered too reliant on the human touch to be lost to automation. The prospect of AI is that it potentially mimics those human capabilities that have typically been responsible for secondary economic growth (West 2018). For example, the helping professions, such as social work, psychology, and education have been immune from automation as these require a human touch that is more responsive, intuitive, and personal than has been achieved by a robot. However, recent advances in AI have allowed for the rise of online automated psychological services. Automated SMS messages can be sent to clients asking basic questions. While such services are currently experimental and are only a supplementary part of a full psychological service, they are also in the infancy of their development. We have also seen the encroachment of automated services into a field long believed to require the human touch, teaching. Universities and emerging educational platforms are experimenting with Massive Online Open Courses (MOOCs) that are free and register hundreds of thousands of students in some cases. The MOOC platform Udacity, an online MOOC course platform, states that one course, CS101, enrolls up to 200,000 students. Many other fields that seemed to be prototypically human have undergone some degree of automation including law and medicine.

The outcome of such expanded automation is a burgeoning ‘surplus’ population. Surplus populations have typically been inhabited by people who do not fit within or who become excluded from the wage labor market. These are typically the unemployed, underemployed or recently dispossessed of economic statistics. While capitalism requires surplus populations to keep wages down and discipline low-wage

workers, too much of a surplus population places a strain on both the economic technologies and the state mechanisms that have typically managed surplus.

In response to some countries, including the US, have considered a Universal Basic Income (UBI) that would replace the current state of numerous welfare options. On the flip side, in the United States proposals have gained traction for a work-for-all scheme in which everyone is provided a job to earn an income (Wilson 2004). Whether a UBI or work for all scheme the outcome would be much of the tenuousness that surrounds a capitalist labor market could be reduced.

A universal basic income would diminish the need for people to fund their living strictly through a job. While a universal basic income may indeed be in the works, there will always be a desire for people to have more than what is basic. This would give rise to what Dahrendorf (1982) calls the 'activity' society in which people are free to choose forms of activity (work, leisure) or that work itself is more humane. Some or even most people will choose to work in some sort of traditional work sector, such as teaching or social work. The difference here is that, in a possible future, one's work will not be the singular component of their identity. The labor market will have multiple possibilities beyond just wage labor. We can see some of this happening now with the rise of the sharing or 'gig' economy (DeRuyter and Brown 2018) and an expanded exchange or bartering economy (Howell and Chmielewski 2009). This is a future that must be worked for, it will not magically appear (Srnicek and Williams 2016).

The takeaway from this analysis is that education has become a tool for the social reproduction of capitalist relations of production. Political, social, and economic forces have homogenized educational practices and outcomes and forced everyone to participate in an alienating school system. The possibility for a future economic system is not so much a world without work but a world with many different work options in which alienated labor is reduced and an educational system that strongly disciplines, regulates, and controls a work force is fragmented.

As I consider the fate of education for an indeterminate future, I will hold on to the idea that education is deeply embedded within a system of social relationships, and that it is impossible to imagine the future of education without simultaneously imagining the future of our other social relationships. While the focus is intentionally on education, there is a companion assumption that as education is imagined so is society.

Education as Utopian Method

Within a world of greatly diminished alienated labor and a divergent meaning for the potential of work, and without a guiding external entity to impose a purpose and a goal on education, it is possible, even imperative, for education to be imagined as something different for the future. The goal here is not to try and determine with any specificity what an education might look like, and it certainly is not about imagining an educational *paradise* free of worry, conflict or want. Instead, I would like to offer

the possibility for an educational utopia. It is not utopia in the sense of an image of a desired place that is other than what we currently experience, but a method for imagining ourselves otherwise. This requires a rethinking of utopia as a concept. To determine an appropriate working definition of utopia, it is important to go back to the original meaning and purpose of the term in Thomas More's book to gain clues as to what education as a utopian method would be.

The term Utopia was originally coined by Thomas More (2001) in 1517 as the title for his book. The title of the book, *Utopia*, is ironic. The meaning of utopia derives from the Latin, ou, meaning no and topia meaning place. The literal meaning of utopia is that it is a no place, a place that does not exist. The plot of the story is that the author meets a traveler on the road, who seems to come from good standing with good references and is someone who can be trusted. However, More named this character Hythloday, which translates to 'someone who can't be trusted.' Hythloday proceeds to tell the story of a remarkable place he has just visited in which people were happy, self-governing, and free of suffering. Hence, the commonly used meaning of utopia as a kind of paradise. However, what was the purpose of his book, was it to say 'look here, I will lay out the contours of how our society should operate so that we could all work to this outcome?' Given the irony of the meaning of the book title, and the farcical name of the man from whom we receive all information about this place, it is likely that this is not the meaning or purpose that the author would ascribe to utopia.

More, it seems, was merely trying to engage in a conversation and debate that was important to his time and place. Arguments in sixteenth century England were raging about the best ways to govern a society, not unlike our current situation (Skinner 1987). By employing Utopia as a strategic provocation, More was inserting certain ideas about governance into a conversation or a debate by being playful, humorous and entertaining. His strategy was to imagine another place that offered a certain perspective on governance and present it to a growing public setting (mass produced print material) for conversation (Hayes and Marino 2015). From its very inception, the term utopia was intended as a method to generate a conversation.

Since the publication of More's *Utopia*, the concept of utopia has come to mean the imagining of an ideal society (Davis 1983). The idea of an ideal society has been put to use in a wide range of activities including art and literature (Bloch 1988), social theory (Kumar 2010) and politics (Goodwin and Taylor 1982). However, if we return to More's original intent, the concept was never to serve as a singular fantasy of a paradise that society might attain. It most certainly was never to be an externally imposed image for the inevitable trajectory of social development. Utopia was not intended to be an outcome, but a method (Moylan and Baccolini 2007). By this method, I mean a body of techniques, strategies, and approaches that can be employed in an inquiry. Inquiry is not a plan for accomplishing a task but a practice employed in an unfolding quest.

To understand utopia as a method I adapt Levitas' (2013) perspectives, as she argues for utopia as a hermeneutic and constructive method that she calls the Imaginary Reconstitution of Society (IROS). IROS, she states, is a 'speculative sociology' where sociology is the intellectual tradition for investigating society and the social

relationships that constitute society and to be speculative is to be curious and doubtful; to engage in an inquiry that may ultimately be inconclusive. Unlike a traditional sociology that seeks an objective theoretical or empirical understanding of society, a speculative sociology revels in the ambiguity, uncertainty, and polysemous nature of the fractal-like structure of society. A speculative sociology is a form of focused and defined inquiry into a particular part of the social world that is provisional, reflexive, and always part of a critical debate. As a form of speculative sociology, IROS is a method that

> Entails holistic thinking about the connections between economic, social, existential and ecological processes in an integrated way. We can then develop alternative possible scenarios for the future and open these to public debate and democratic decision-insisting always on the provisionality, reflexivity and contingency of what we are able to imagine, and in full awareness that utopian speculation is formed always in the double squeeze of what we are able to imagine and what we able to imagine as possible.

A utopian method is a central component of a democratic decision-making process about the future.

Levitas further argues that there is a sociological content appropriate to IROS as a speculative sociology that entails archeological, ontological, and architectural modes. In the archeological mode, a utopian method scours current and historical sources for evidence of a utopian impulse that could be held on to for the future. In the ontological mode, the kinds of people and the forms of human flourishing that might be encouraged by certain social structures are considered. In the architectural mode, an IROS actually generates the framework of an alternative possible social structure.

As a kind of overarching statement, I accept the utopian method of IROS as speculative sociology. However, while Levitas offers the overarching contours of a utopian method there are particular elements that are assumed, underdeveloped, or overlooked. These include imagination, design, and dialogue. While each of these is embedded in Levitas' speculative sociology, I believe that explicating them and recentering them in the methodology offers a more solid mechanism for employing utopia to imagine education in a post-alienated labor world. First and foremost in this method is the role of the imagination.

Imaginations

Since utopia, by definition, exists in another time and/or place and is, at least theoretically, unreachable, it requires an imagination to examine and understand its' contours. While Levitas invokes the idea of imagination she assumes a particular understanding of imagination rather than devoting space to any meaningful discussion. In fact, she assumes an untenable separation between imagination and reality that harkens back to Aristotle, Descartes and Spinoza in which the imagination is a superfluous if not destructive antithesis to reason. She states that the imagination must be put to the service of making changes in the 'real' world. In this particular

conception and throughout her book, Levitas consistently separates the imagination from what can be called a real world, 'This is the third way of thinking of utopia itself, the attempt not just to imagine, but to make the world otherwise' (Location 134). By separating imagination from making, and by adding the qualifier, just, to imagination, Levitas follows a common path by indicating that imagination is a secondary, or less important, faculty in the utopian method. I rely on a conception in which imagination is an elevated and indispensable human dimension that fuses consciousness and poetic design in the imaginative making of a utopia (Hayes and Marino 2015).

Too often, imagination is conceptualized as a mental phantasm: An image existing only in the mind. However, imagination acquires a more corporeal function in the 'imaginal' (Bottici 2014). For Bottici, the imaginal stands as the intermediary between the material and immaterial world and does more than create representations of the world. The imaginal is a kind of acting imagination that 'does not simply mirror the empirical world, but is instead endowed with the capacity to create one' (Bottici 2014: 55). The imaginal suggests that our mental images have ontological standing in the world, they are corporeal and exist as a reality, 'no longer seen as an illusion, non-being, but as a world out of reach' (Braga in Bottici 2014: 67). Braga, argues that the contemporary formation of the imaginal has found a home in the Icono-spheres or Imago-spheres of what he calls 'The global culture of images' (Braga in Bottici 2014: 66). Far from being only mental constructs, these imagistic and imaginal spheres of life experience frame and guide how we live in and experience the world. They are mediational devices that transform and transpose how we form relationships in our contemporary global culture. Appadurai (1996), offers a similar analysis of how imagination operates in global culture by stating that the imagination is central to everyday concrete life experience. The imagination he states,

> …has become an organized field of work (in the sense of both labor and culturally organized practice) and a form of negotiation between sites of agency (individuals) and globally defined fields of possibility (location 646)

For Appadurai, the imagination creates real effects in the world by organizing work and mediating how possibility is generated for individuals and collectives.

The imagination is a dimension of everyday life experience in the world, it is not separate from or other than. As a dimension of lived experience, imagination opens a space beyond our observed or experienced reality. It is a space of play that allows for a disengagement with current realities to explore other possibilities.

Imagination is a collective form of social action and the effect is on the level of the social group or movement. An imagined future attains an ontological capacity and becomes integrated into a conceptual and concrete movement toward actualized social structures in which the effect is nothing more than the constitution of society (Castoriadis 2002). To constitute society the imagination works in two ways: (1) it allows a group of people across space and time to see themselves as a collective with shared ideas and dreams, and (2) it is employed by the group to develop hopeful imagery and action about what the future can be like. Without such imaginal won-

derings, 'we are left only with the residual dreams of the powerful' (Haiven and Khasnabish 2014).

As an imaginal practice, the images that are concocted about education do not become a clearly and specifically detailed objective or an outcome to be attained but a series of beckonings and allurements: A desire for what might be. The imaginal is concrete and corporeal, not as in an object, but in its effect on the world. We must also understand that imagination has the ability to collapse space and time so that past, future, and present constitute an organic ferment. Thus, imagining a future simultaneously involves impacting the present and the past. Since the imagination exceeds and transcends contemporary or historic realities, there is a potential for proliferating intellectual and corporeal possibilities, thus expanding and deepening the meaning and practice of education.

Education is a fundamental human activity and right (United Nations Education, Scientific and Culture Organization 2007). It is one activity that all humans must participate in and experience, and is, thus, the perfect space for a collective imagination. Yet, a collective imagination will not concoct a singular image of education. That would go against the expansive and diverse reality of human consciousness and experience. Instead, a utopian method fosters diverse educational imaginations. In a post-alienated labor world, we will not participate in one kind of labor and we will not participate in one kind of education but many. We have already seen the rise of informal learner activated education through the internet that includes YouTube, Facebook, and Twitter, and the more formal, but choice driven MOOCs and educational platforms such as Wikiversity, Udacity, and Coursera. What we call school can be further fractured from formal academic driven schools to the autonomous Sudbury model or democratic schools. There can be the expansion of experientially—based on the job education of apprenticeships and internships. There are many other forms to discuss, but suffice it to say at this point that the utopian imagination of education will encourage a diversity of educational options to flourish.

Conversation ←→ Dialogue

Returning to Levitas' IROS, she argues that a utopian method should be entered into a kind of democratic process, yet little is said beyond that statement. The kind of democratic process employed by More in his original novel focused on dialogue. More chose to enter Utopia into the mass communication tool of his time; a book produced using a printing press. Through the available system of distribution, More ensured that the book would be read and entered into the conversation of the time, as well as ensuring that the potential conversation would carry on well into the future. In this section of the chapter, I will discuss the importance of conversation and dialogue in a utopian method. I treat conversation and dialogue as similar but unique forms of communication that are essential to democratic decision-making and to a utopian method.

Often dialogue and conversation are conflated or used interchangeably. For example, Burbules (1993: x) begins his book on dialogue by arguing that conversation and dialogue can be considered the same thing, 'it is possible to consider any sort of conversation a dialogue'. He goes on to state that he will limit the term dialogue to a particular meaning for his analysis so that it is a 'pedagogical communicative relation'. Here, I treat conversation and dialogue as related forms of communication that have slightly divergent goals and intentions. This is due in large part by the kind of direction that is imposed on the communicative interaction by the participants. I rely heavily on a definition of conversation offered by Michael Oakeshott (1959).

For Oakeshott, the conversation is much less directed than dialogue and much less intent on arriving at an endpoint. It is not an inquiry or a debate and there is no 'proposition to be proved, no conclusion sought' (Oakeshott 1959: 196). A conversation is inconclusive and indeterminate, as it wanders across an intellectual landscape without certainty. A conversation is held in place, limited and framed only by the desires of those who participate in this form of communication. It is, as the title of the book detailing a conversation by Horton and Freire (1990) suggests, an endeavor in which we, 'Make the Road by Walking'. A conversation has a content but not one that defines the purpose, goals, and outcomes of the interaction, it is an 'intellectual adventure' traversing the divergent pathways of consciousness.

However, the conversation is more than just a form of direct communication between individuals or within a group. It is the nourishment of our humanity. Everyone, irregardless of social standing intellect, geography, and time, has contributed to this conversation of humanity. It is the grand human achievements of science, philosophy, literature, history, government, and art. It is the essential cultural traditions of cooking, weaving, fishing, and voyaging; playing a guitar and chatting with a neighbor on the porch. Placing our ideas and practices into the conversation is the glue that holds people together as humanity. It is diverse, divergent, and expansive. There is no inherent reason why, in a conversation, one perspective or voice gets sublimated to another. We do know that systems of power make some voices seem louder and some perspectives more valuable than others, but it is the openness and welcoming nature of the conversation that forestalls the closing and allows for democratic decision-making.

Dialogue, on the other hand, begins with a purpose. Burbules (1993: 8) states that dialogue is 'guided by the spirit of discovery'. This places Burbules' conception of dialogue in direct contradiction to Oakeshott's conception of conversation. The meaning of dialogue comes from the Greek origin of the word, dia, meaning through and logos, meaning reason. A dialogue is a reasoning through more akin to an exegesis rather than a discussion. The term was more formally developed to examine the ways in which characters in a play communicate among themselves and with the audience. The overarching purpose of dialogue whether in a play, as a literary genre or as a form of direct communication is to engage in an inquiry, to explore, and examine something. Dialogue has a purpose, which is to think through a particular topic, idea, or concept. Dialogue assumes that there is a direction and purpose for the communication. For example, *Utopia* was written in the literary genre of a dialogue with characters engaging in an exchange of ideas and moving the plot forward through

an intimate verbal interaction. In *Utopia*, the dialogue between the main characters is how the reader comes to understand what Utopia is. The purpose of this dialogue was to generate an image of a particular place called Utopia.

Fusion of Horizons

I employ conversation and dialogue as a central component of a utopian method because of how these forms of communication act as a democratic method generating a shared understanding, or, what Gadamer (2004) calls a fusion of horizons. A fusion of horizons is a hermeneutic dialectical method of generating a common or shared image of the world with others. A horizon is a geographical concept that denotes the limit and extent of what an individual can see in a physical as well as in a conceptual and intellectual sense. The horizon, thus, establishes opportunity as well as a boundary. A horizon is not static, and as we shift position the horizon accordingly shifts. A horizon can be transformed and expanded when in conversation or dialogue with others who experience and are able to share a different horizon. It is in the indeterminate wandering adventure of the conversation that horizons fuse. In a fusion of horizons, the imaginative agents do not lose or subsume their images to others in the conversation, neither do they come to dwell in identical imaginary topographies. Instead, the participants 'transpose' themselves into the horizon of the other but only to the degree that they 'bring themselves' into that horizon. The effect is not just another horizon but one that, 'always involves rising to a higher universality that overcomes, not only our own particularity but also that of the other' (Gadamer 2004: 304).

As an educational utopia, conversation and dialogue serve as the central strategies for a collective imagining of an educational future. The openness, flexibility, and ambiguity of conversation exist in a dialectical relationship with the more focused and intentional terrain of a dialogue. If the overall purpose and function of education is to be reimagined there must be a renewed conversation and dialogue that will fuse the horizons of a wide range of stakeholders and constituents. It is through a generative democratic process that diverse forms of educational practice can be designed for a future purpose.

Design

The feature of IROS that Levitas defines as architecture, I describe as design. In writing *Utopia*, More engaged in a process of designing Utopia. While I do not know what process he actually engaged in, it is my guess that he approached the development of Utopia as would most any writer; as an indeterminate process that changed, maybe even radically over time. Before setting pen to paper he had probably worked through a series of images of what Utopia would be like, beginning with a

kernel or a vague outline of what he intended the place to look like. Writing is a generative, rather than representational activity that is an incessantly iterative and persistent process of imagining, writing, editing, reimagining, rewriting, reediting, etc. In writing the book, More designed the image of Utopia by sculpting it into existence through an iterative writing, thinking, and imagining process.

As much as More designed Utopia through the writing process, education is designed through a utopian method. Too often, education suffers from planning, in which a particular vision or version is determined and a set of steps elucidated to bring that image into a reality. While the design is intended to produce an outcome or a solution to a problem, the process does not begin with the assumption that an answer will be the endpoint. According to Terzidis (2007), design integrates the phases of a creative process into an intentional and emergent whole. The beginning, outcome, and development are indeterminate and ambiguous for which there can only be anticipation and not certainty.

A design process is infused throughout with imagination and creativity and integrated with action and organization so that intellectual and physical activity emerges coincident with their products in the world. The design does not separate conceptualization from production, or imagination from action, these are wholly folded into the entire process. The design places generativity and creativity on an equal footing with the analytical and critical.

The design is an attempt to harness the evanescent, like capturing a cloud. In design, the problem and the solution are in a constant state of emergence, always influencing each other in a recursive cascade of conceptual movement and change. It is an anticipation and expectation where the focus is on the 'not yet' and the 'what is going to be'. The outcome of design is entangled with the process such that the endpoint does not dictate or override the process, and serves more as a trope signaling a collapse of the conceptual and corporeal. Design is the process by which things come to be in a purposeful and intentional manner, but without assurances (Terzidis 2007).

In an educational utopia where the imagination is integrated into concrete effects in the world of experience, the images conceptualized through a shared mental activity are themselves a deliberate effect in the world. The intentional directing of the utopian method leads to designing the future of education. This means creating images, engaging in conversations, and manufacturing working alternatives about what we want education to function as, to look like and to be. What is needed now are less theories that explain the problems of school, or research describing best practices, but a collective conversation and design process by which the next phase of education is purposefully imagined and designed. In a method of utopia and poetic design, an education that fosters human flourishing can only be generated through a process that is itself guided by these principles.

The Quest for Educational Wisdom

What we imagine an education to be is nothing more than our values made concrete. Consequently, a utopian method is the knowledge and practice that comes from a method that is fundamentally integrated with human values, it is wisdom. As Levitas argues, utopia is always about enhancing human flourishing. Rather than just simply survival, flourishing assumes that each human has the ability to imagine and make happen their choice of a life, it is an anti-alienated labor.

A utopian method is fundamentally about generating wisdom. Too often, our work as scholars is about producing information, theory, critique, understanding, data, or knowledge. These are so ingrained in the DNA of scholarly work that to question their validity or purpose is almost sacrosanct. Defining wisdom is a difficult task but definitions typically foreground the values of human flourishing as they are deeply ingrained into thinking and decision-making. Wisdom is also the ability to work within uncertainty and to know the limits of one's understanding (Hall 2010). As a method, utopia is a quest for wisdom as it lays out a process by which education can be reimagined and the values of human flourishing animated.

This means that utopia is guided by certain values that lead to human flourishing. In terms of an economic model, flourishing is at the center of Amartya Sen's (1999) Capability Approach. Sen, an economist, developed the capability approach as a challenge to neoliberal economic reasoning that focuses on the dynamics of a market-based economy. The Capability Approach asserts that social, economic, and political development should be assessed on whether they nourish freedom and reinforce the development of meaningful lives (Crocker 1992). Martha Nussbaum (2000), writing in support of the Capability Approach, has constructed a list of capabilities that she believes are central to human flourishing and includes life, sense, imagination and thought, play, and control over one's environment. These are value statements about what can be constituted as good and right in the development of human capabilities. An educational utopia needs to constitute and be guided by a wisdom that infuses images and ideas, understanding and activity with the values of human flourishing and well-being.

In a utopian method, the purpose is not to define a set of normative values that are required to be part of every educational imagination. Nussbaum, created a list she feels is important for generating human flourishing, which is fine, but I could imagine the inclusion of other values including beauty, love, compassion, abundance, equality, justice or forgiveness. What is of importance to any particular utopian imagination of education will differ given the place, time, and the constitution of the collective.

Conclusion

In an educational utopia as a method, what education becomes, whether provisional or final; whether conceptual or corporeal will necessarily be guided by a quest for wisdom. In one sense, a utopian method is conducted through strategies that inure

a certain value, such as imagination, conversation, dialogue, democratic decision-making, and a fusion of horizons. In another sense, specific values are intentionally ingrained in the method that includes flourishing, equality, community, and beauty. The actual form that any particular iteration of education becomes within and through this method is less of a concern than the fact that the method itself enables these values within some conception or practice of education. Fundamentally, an educational utopia as method asks us, the community of scholars, to move beyond examining, understanding, or critiquing education and engage in a poetic design in which we use our work to imagine a better world (Hayes et al. 2015).

An educational utopia is not necessarily about reinventing the educational endeavor and is more about a collective reconstitution of the vision, mission, and image of education as other than school. I am hoping for a rejuvenation of the imaginal spirit of education that has allowed for a proliferation of educational forms to emerge throughout history. This may mean that in any given locale, a particular image and practice of education is agreed upon and implemented that is different from other places, but when viewed holistically as a complex and divergent human endeavor, this method seeks to radically expand the capacity for educational possibility. Within any image or conception of education, human flourishing, well-being, and freedom must be at the center.

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Chapter 22
Afterword: On Education and Technological Unemployment

Timothy W. Luke

The purposes of higher education all are coming under much closer critical scrutiny in the twenty-first century, particularly in relation to the digital disruptions being caused by 'the Fourth Industrial Revolution' (Mims 2018: R1; Schwab 2017). As every industry encounters new digital developments, workers face existential threats to the control of their existing jobs and the value of all their past, present, and future educational training. Whether one looks at the policy worries associated with workforce preparation, intellectual property, job creation, and public funding or the cultural concerns posed by technological unemployment, cognitive capitalism, skill obsolescence, and privatized support, the entangled dependencies of what collective labor is as well as how individual learning could be conducted to heighten its productivity are being continuously reevaluated around the world.

The full complexity, instability, and urgency of these challenges for government leaders, business managers, and individual students, however, come into much sharper focus with the research findings from a wide range of specialists presented in this remarkably comprehensive collection, *Education and Technological Unemployment*, edited by Michael A. Peters, Petar Jandrić, and Alexander J. Means. The authors provide a wide-ranging overview as well as an intensive critical assessment of what human learning is now, and then debate what it must become in university settings and other schooling environments as their staff and students confront the deep changes intrinsic to the waves of technological unemployment being caused by autonomous systems, networked computing, robotic devices, artificial intelligence, and nanotechnology tools. How human beings and nonhuman intelligent systems will coexist within these new high-tech environments plainly is one of the world's most pressing problems at this point in history.

The significance of education for individual socialization and collective intergenerational cultural reproduction is becoming a more urgent question—in terms of both cost and content—for all peoples and societies, as the editors and contributors

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featured in this collection illustrate with each of the volume's 22 chapters. Of course, these writers are well aware that the rapid proliferation of capital-intensive, fossil-fueled, and technology-driven jobs over the past 150 years has constantly shaped the characteristics of embedded 'technological unemployment' by forcing many workers into jobs rooted in newer 'technology-driven employment' around the planet for many decades. More than ever, however, workers now must also cultivate an 'ethic of permanent improvement' through continuous higher education that gets into psychosocial changes far beyond the traditional craft discourses of industrial labor, as they each try to morph into 'a skill-machine' that entails embracing the 'lifestyle, a way of life' keyed to continuously skilling the machines as well as themselves (Foucault 2004: 242). The strategies to address the social conflicts triggered by these new waves of technological unemployment often are deeply at odds, but they can be better understood from the perspectives outlined in this book.

To attain that end, various studies in the first section on 'The Postdigital Fragmentation of Education and Work' pose the key questions anchoring the volume, like Michael A. Peters and Zhao Wei in Chap. 2 "Intelligent Capitalism' and the Disappearance of Labor: Whither to Education,' Richard Hall in Chap. 4 'On Autonomy and the Technological Abolition of Academic Labour' or Tina Lynn Evans in Chap. 5 'Transdisciplinary Engagement with Enforced Dependency.' Without actual employment for humans, what will be the role of human workers? If human workers become obsolete and their labor is superfluous, what role will universities, schools, and all educational institutions have in society? Are these trends cause for alarm or the basis for hope? After all, the automation of production and/or augmentation of work with digital technologies could free human beings to create a much more sustainable, democratic, and just society for all rather than yet another antihumane, dictatorial, and unjust order to serve small powerful elites.

The second section on 'What Can Places of Learning Really Do about the Future of Work' explores these dilemmas in more detail as human subjectivity is being reshaped to coevolve with machinic objectivity. Sam Sellar in Chap. 10 asks how the emerging forms of technological unemployment create truly new conditions for educational thought. Similarly, Sarah Hayes explores the identity of 'employable posthumans' to help develop higher education policies to strengthen human collaboration and community. And, Murray Robertson considers the qualities and characteristics of 'care work' through the human cycles of aging to emphasize how it must remain a central societal priority as well as a site of constant technological improvement.

The third section, in turn, on 'Education in a Workless Society,' outlines possible new identities and institutions for a world mostly defined by technological unemployment. Nathan Schneider in Chap. 16 suggests 'A Wantless Workless World' could return society to more commodious, fraternal, and satisfying order of cooperative enterprise modeled on the guild structure of early universities. In Chap. 18, Patrick Carmichael sees 'The Refusal of Work, the Liberation of Time, and the Convivial University' all coming together fruitfully in the 'post-work' future. And, Jeremy Knox puts a new spin on the significance of 'entrepreneurialism' by asserting this cultural practice is best matched now to guide digital education, work, and learning during this historic transition. As Michael Hayes claims in Chap. 22, with society on

the verge of a utopian transformation and education when freed from its preparatory functions for employment, educational activities could serve as a 'utopian method' to reimagine and redirect human beings, technical systems, and social values to shape a world of post-alienated labor.

On the one hand, much of this debate leverages the anxieties about precarity, obsolescence, and immizeration first posed by Adam Smith's celebration of the complex commercial division of labor in early capitalist manufacture and Karl Marx's critique of alienation, domination, and exploitation in the new industrial economies of fossil-fueled capitalism in the eighteenth, nineteenth, and coming twentieth centuries. On the other hand, unanticipated supergenerative consequences of unintended technological change are cascading out of fresh developments in digitalization, automation, networks, and robotics. At the conjuncture of these contradictory trends, where the existing conditions of capital ownership, financialized management, governmental deregulation, consumer-centered culture, and class war all are ensnared in permanent low-intensity conflicts, the authors generally see 'technology,' as arising and acting apart from the sphere of 'capital,' as the new 'artifactuality' of digitalization and data.

Still, Technology here is Capital, and this capital increasingly is cognitive, symbolic, and technified. Neither technological change nor capitalist growth is an inexorable force. Even though much this churning change is cloaked by myths of managerial command-and-control, it also is tied to the 'visioneering' work of big consulting companies, like Accenture, BDO, KPMG, or McKinsey, that popularize the cybernetic sociologies of coping with cloud computing, augmented reality in the workplace or workforce restructuring around automated systems (McKinsey Global Institute 2017; KPMG 2017). Yet, these narratives simply contextualize the 'imagineering' work of Alphabet, Apple, Cisco, Microsoft, Dell, or IBM as well as Amazon, Airbnb, Facebook, Netflix, Twitter, or Uber that suggest they are all pushing far beyond traditional education in creating technological unemployment as part and parcel of either Google's one-time 'Don't Be Evil' mantra or Alphabet's new-found 'Do the Right Thing' guiding commandment (Barr 2015). Lazzarato might note 'the so-called knowledge economy fails to account for most of class relations the theory of cognitive capitalism attributes to it' in this shift from 'don't be evil' as it faces radical cuts in cognitive/knowledge investments by the state despite their innovations; instead, 'do the right thing' is the consciousness 'of the debtor affected by guilt, bad conscience, and responsibility' that follows from transforming 'each individual into an indebted economic subject' (Lazzarato 2012: 50, 52).

This loosely tangled combination of individual opportunity, cultural cohesion, and technical preparation with personal identity, social inequality, and political power typically condense at the education nexus. The intersections of work, school, government, technology, and business, where economies and societies are forced to somehow manage who gets what, where, when, and why in the ever-changing concourses of technology, are continually contested sites. For the most part, there has been very little prior experience with comparable crises tied to basic public educational services and analogue technologies in the past. Still, the means of addressing even those conflicts usually proved to be violent, unequal, and incomplete as the

literate classes imposed their rule on illiterate subaltern groups in schools and on the job before the digital revolution. How these struggles are playing out in the Fourth Industrial Revolution is different. With precariously underemployed and unemployed service workers and symbolic analysts, they often leverage high personal debt to gain higher educational attainments beyond what many jobs really require, but master's degrees become the minimum thresholds set to even apply for positions to watch over machines learning from big data to refine their artificial intelligence.

Basically, the bottom line for the political economy behind changes is reducible to three possibilities. All of them are imperfect, but any one of the three becomes a real option at this juncture in history. First, humans will be able to master cognitive capitalism's knowledge economy well enough to remain wholly in command of all the liberatory possibilities in artificial intelligence and robotics, allowing education to become more oriented toward meaningful ethical, technical, and practical preparation for life in a new world approaching something like utopian abundance plus full human liberation. Second, the artificial intelligence, automated systems, and networked assemblages in high technology systems will accelerate beyond the abilities of any humans to fully understand, and, more importantly, control them, leaving human beings in a condition of self-imposed servitude subjugated to this grand technological apparatus as such. Thus, humans will become candidates for uncomfortable obsolescence, in forced retirement or even perhaps extinction. Once they are no longer operationally useful, since the distinguishing singularities of human sapience, sentience, and soul are perhaps subsumed by the technologies themselves, enabling them to evolve independently, human education would become the hard lessons for surviving with these superior forces or, at least, the insights needed to coexist after being rendered superfluous by algorithmic capital. The third scenario is 'business as usual.' Here, small elites would inject more and more technology into the existing cycles of consumption and production, creating tremendous new waves of human unemployment, and then persistent underemployment, but never total joblessness. Instead, education would focus on coping with the perpetual underemployment of most, but while a few people would enjoy living off the production of highly rationalized labor performed almost automatically by more and more technology. While it might not be a dystopian disaster, the business-as-usual option will trap most humans in games of artificial scarcities, irrationalities, and inequalities that surely will turn the general human condition into one as bad as what is only endured by the very poorest in today's destitute Global South, if not worse.

In this respect, Chap. 6 by Chris Arthur, 'Is Entrepreneurial Education the Solution to the Automation Revolution?' Chap. 11 by George Lăzăroiu, 'Educating for a Workless Society: Technological Advance, Mass Unemployment, and Meaningful Jobs,' and Chap. 20 by Jeremy Knox, 'The Creative, Problem-Solving Entrepreneur' all speak to how the ideological alibis of neoliberal creativity and innovation could shield some modes of labor that theoretically lie beyond the grasp of automation, dronification or robotization. Their sticky tasks and wicked problems would still be touted as uniquely 'human' realms of action for human workers to excel come what may. While this claim is difficult to contest, once such entrepreneurial endeavors are chartered, commodified, or channeled for the demands made in their most apropos

markets, the inevitable pressure to substitute fixed capital and flexible algorithms for such human labor once could again kick into action. With up to 40 or 75% of human jobs on the line, Arthur's vision of swelling 'Silicon mobs' becoming angrier and more aggressive is daunting.

Whether or not true craft work, fine art craftsmanship or entertainment performance is the 'creative' or 'entrepreneurial' way that humans will respond to these crises with more STEM training to keep the-soon-to-be obsolete laborer hopping from one creative gig to another before automation crushes the creativity keeping their livelihoods viable remains to be seen. Both possibilities seem plausible, but how many great operas and/or technical breakthroughs can even a few people produce day after day, either gainfully or not. In the end, Steve Fuller's case study in Chap. 8 may identify the decisive issue, namely will autonomous technicity in the economy and society turn 'technological unemployment as a test of the added value of being human'? His exploration of what 'human nature' is, and how its partial, considerable or full cyborganization would be managed as most human beings willingly surrender to collective 'technicity' over maintaining their individual 'humanity' as cyborganization intensifies is important.

Without saying it directly, the enlightenment notions of Voltaire's Dr. Pangloss, who trusts the divine purpose of providential reason blessing whatever events erupt from the given natural world is the model here. If a continuously improved human world becomes 'the best of all possible worlds,' then being made redundant by Kurzweil's (2006) adulation of 'the Singularity' makes the computing powers behind today's postnatural machinic world a cosmic force defining 'the best of all possible worlds' today. In other words, Voltaire's 'theodicy' easily morphs into Kurzweil's 'technodicy.' Many breathless siliconological revelations already paint humanity's future in these near metaphysical terms of world historical importance. Many of Fuller's sources are works of speculative (cybernetic) fiction about today's cybertechnic industries, but there are precedents for such visions being embraced in the speculative (machinic) fiction of paleotechnic industries from the 1780s to the 1920s when many apparently believed General Electric did 'Bring Good Things to Life' (Kranhold and Silverman 2003).

These alternative history puzzles also raise the potential existential contradictions posed by new machinic modes of being, which if they only are extensions, emulations or expressions of some vital aspects of actual human beings, e.g., artificial intelligence, cybernetic nerves, electronic brains, robotic arms, and unmanned autonomous vehicles, they would lose their ultimate foundational grounding. Without that organic sapience or sentience which they express, emulate or extend, what purpose could artificial intelligences have? In whose capacities would they elect to exist, to which ends would be directed, for how long would they continue? Without the templates, foundations, or grounds of engineering themselves as 'the artificial' from out of their 'natural origins' how could their otherness persist? In other words, as even Accenture (2018) admits, 'intelligent tech needs ingenious humans' to survive.

The means and forces of production loom large in most of these studies, which is explicable given the interest in how education currently is styled, valorized, provided, and experienced as a public good and/or private service to condition work

and laborers. The Bowles and Gintis 'correspondence principle' (2011) that posits the factory and firm are the decisive underlying model for labor and management that overlays blue and white collar labor in the economy into schooling at all levels of society is well known. To stave off irrelevance, obsolescence, or precarity, the latest educational formulae must match the corporate and government sectors' celebration of productive capitalist goods and services in high-tech market places with comparable educational packages in the education sector, as Chap. 7 by Neil Frude, Chap. 12 by Sarah Hayes, Chap. 15 by Murray Robertson, and Chap. 17 by Alexander J. Means all effectively argue.

As compelling as all of these chapters are, there is less attention paid to the contemporary regimes of 'governing by debt' (Lazzarato 2015) in which the means and forces of imposing monetary payments by debtors to creditors arguably have become a far more potent ordering principle, which exceeds the control of Capital over Labor articulated through 'governing by work.' At the dawn of the Fourth Industrial Revolution, some contemporary Marxian critiques see these power dynamics becoming more significant, because the production and consumption relations shaped by growing cybernetic abundance are fueled by sovereign, corporate, and personal debt as much as technology. Hence, they become constrained today by the cycles of credit and debt, which mediate the 'economy of power' (Foucault 2004) sustaining capitalism as a system of policing nations and state power above and beyond the neoclassical system of government stimulating economic growth and technological development.

As Lazzarato (2015: 64) asserts, 'the American university is the ideal realization of creditor-debtor relationship,' and, clearly, 'the American student perfectly embodies the condition of the indebted man by serving as the paradigm for the conditions of subjectivation of the debt economy one finds throughout society.' The financialization of everything clearly is 'undoing the demos' (Brown 2015) behind contemporary life as well as the shackling of the creative classes to cognitive capitalism. Each of these twists and turns is credited with the innovations of 'artificial intelligence' credited with causing technological unemployment on 'the digital frontier' (McKinsey Global Institute 2017).

While each of the authors in this fascinating collection grapples with the problems of labor and education, it seems the next step in studying the 'disrupt and grow' dimensions of artificial intelligence, robotics, and big data (KPMG 2017) is discovering how precarious both firms and individuals are as permanent debtors beyond labor and unemployment. Facebook Amazon, Netflix, and Twitter are mostly momentum stocks whose profitability in many ways are still to be proven, and many of their cognitarian employees are overleveraged agents caught up, like their employers, in grappling with debt. This dynamic in contemporary societies follows from borrowing to pay for more education, since 'debt ignores boundaries and nationalities: at the level of the world economy it knows only creditors and debtors…. it forces us to shift our perspective from labor and employment in order to conceive policies at the level of Capital as Universal Creditor,' which, in many ways, sublates Marxian modes of critique as 'debt surpasses the divisions between employment and unemployment, work and nonworking, productive and assisted, precarious and nonprecarious, divisions on which the left has based its categories of thought and action' (Lazzarato

2012: 162). This collection by Peters, Jandrić, and Means does not shrink from tackling many of these growing tensions. And, the authors featured by the book expertly examine schools and workplaces to expose the major contradictions facing individuals and societies with respect to the high-tech displacement of well-educated workers by artificial intelligence, and the quick replacement of humans in good highly skilled jobs by cheap technology.

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