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The futures of work: what education can and can't do

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Futures of Education
LEARNING TO BECOME

Abstract

It is commonly assumed today that education is crucial for meeting the challenges concerning the futures of work. But education cannot make up for inadequacies in other policy domains that have caused and continue to cause declining job quality as well as mass unemployment and under-employment. We suggest that preoccupation with aspirational curriculum reforms like '21st century skills' and 'micro-credentials' promoted to achieve employment growth can be a distraction from what successful education systems can achieve. At their worst, they compromise the capacity for education to play what constructive role it can play in meeting the challenges surrounding the futures of work.

We present the argument in four parts:

- Section One considers the context in which education will be operating for the foreseeable future. Climate change will be fundamental. The other key issues will be changing life courses (especially changing gender relations); technological change (especially automation and data-ification) and inequality.
- Section Two highlights the significance of two currently neglected but crucial guiding concepts: labour demand and education as a distinctive domain. These concepts enable us to understand what education can and cannot do concerning the futures of work.
- Section Three argues that at its best, education helps people master bodies of conceptual knowledge as well as relationships between bodies of knowledge, nurtures learning dispositions, and equips people with skills and capacities that support the common good. These qualities enable people to handle changing life courses and challenges arising from Artificial Intelligence (AI) and a world drowning in information. Education can also support new configurations of expertise made possible by new technologies and new configurations of power.
- Section Four considers policy implications. It highlights the importance of building effective institutions: agile stability in education systems and new organisational forms for occupational citizenship in labour markets.

Finally, in the conclusion we argue that while education cannot solve most problems concerning the futures of work, there can be no solution to these problems without quality, enduring institutions supporting education and occupational coherence in the labour market.

Introduction

The future of work is not what it used to be. In the 1960s and 1970s the debate, at least in rich countries, concerned the coming leisure society. In the 1980s and 1990s, the promise was infinite flexibility and choice. Today, the spectre of mass joblessness looms as large over wealthy countries as it has for decades in poor countries—first from robots taking jobs, now the legacy of the COVID-19 crisis. One thing, however, remains unchanged: the assumption that education is *the* critical factor for individuals' success in obtaining and succeeding in work. At one level this is flattering to educators. It elevates education to being of the highest importance. In practice, however, this framing is at best problematic and at worst destructive.

First, most future of work narratives expect education to overcome deficiencies in other realms of policy. Second, this framing overlooks the important role education can (or should) play in nurturing knowledgeable, independent, creative, and critical citizens and workers.

What some have in the past called the 'education gospel' has been dominant since the 1980s, and is still prominent today (Grubb and Lazerson, 2004; Tomlinson, 2009; Enders, 2010; Brown, Lauder and Ashton, 2011; Livingstone and Guile, 2012; Allais, 2014). Education is expected to perform the heavy lifting in poverty eradication as well as economic growth and development in poor countries[1]. Little emphasis is placed on how poverty constrains education[2]. As in the past, education will 'fail' to meet these expectations, because it cannot do what macro-economic and industrial policy alone can do to create quality jobs. The idea of solving inequality through individual social mobility created through education is part of an ideology of that avoids tackling economic and social development directly. 'Failed' education and the 'failure' of individuals to obtain the 'relevant skills' are the scapegoats for lack of development. In economies in which four-year university degrees are almost the only possible route to dignified work and a decent life, and in which even such degrees increasingly do not lead to good jobs, frustration, anger, and resentment will increasingly be seen.

Education consequently suffers from two problems. On the one hand education is positioned ambitiously as a key solution to economic problems; on the other hand, it is undermined—it is not seen as a distinctive and important social activity with its own internal logics. The combined effect is that education not only disappoints due to unrealistic expectations, but also, reconfiguring it to 'solve' deep employment problems compromises its core mission. Other problems with this type of approach include undermining teachers, weakening educational institutions, and drawing attention away from (and often deepening) the real problems in schools and other education institutions.

It is time for realism to inform the deliberations about education and the futures of work. It is time for education to be brought back into the debate as important in its own right and not as an auxiliary policy tasked with overcoming the flaws of other policy domains. Doing so, ironically, makes it more likely that education will be able to prepare people for the changing world of work that Artificial Intelligence (AI), the climate crisis, and changes that other megatrends may bring.

Our argument is simple. Education cannot make up for inadequacies in other policy domains that have caused and continue to cause mass unemployment and under-employment. But education is a crucial part of any policy mix, and it requires properly nurtured and resourced education institutions and systems. By contrast, we suggest that preoccupation with aspirational curriculum reforms like '21st century skills' and 'micro-credentials' promoted to achieve employment growth can be a distraction from these key pre-conditions for successful education systems. At their worst, they compromise the capacity for education to play a constructive role in meeting the challenges surrounding the futures of work.

We present the argument in four parts:

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- Section Two highlights the significance of two currently neglected but crucial guiding concepts: labour demand and education as a distinctive domain. These concepts enable us to understand what education can and cannot do concerning the futures of work.
- Section Three argues that at its best education helps people master bodies of conceptual knowledge as well as relationships between bodies of knowledge, nurtures learning dispositions, and equips people with skills and capacities that support the common good. These qualities enable people to handle changing life courses and challenges arising from Artificial Intelligence (AI) and a world drowning in information. Education can also support new configurations of expertise made possible by new technologies and new configurations of power.
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Section One: Context—key emerging opportunities and constraints

Before considering what education can, and ideally should, do, we consider the key megatrends unfolding now and likely for the foreseeable future, which will shape the futures of work. Heading the list is the climate crisis. This will increasingly overshadow all other developments. The key forces shaping the climate crisis are beyond the control of education. The power of the fossil fuel lobby and deeply ingrained consumption and production patterns, particularly consumption patterns in wealthy countries, are amongst the most obvious factors behind this slowly unfolding crisis (Malm 2016, Wright and Nyberg 2015) Education can play a role in increasing awareness about these changes and necessary adaptations—but it cannot be the central factor in the overcoming the crisis. We focus below on some megatrends, or more precisely structural changes, that have traditionally been regarded as amenable to change through education. These concern changing life courses (especially for the young, the old and women), technological change, and inequality.

Changing life courses (especially the role of women)

Over the last century in the developed world and the last half century in the developing world there have been profound changes the fundamentals of people's life courses. Arguably the biggest three life transformations concern life expectancy, levels of educational attainment, and women's workforce participation.

In developed countries life expectancy has increased by 30 – 40 years since the early 1900s. In Vietnam it has increased by 14 years since 1960. In Kenya in the first decade of this millennium it increased by 10 (WHO 2020)

Trends in education have been equally dramatic. Throughout human history most people were not formally educated. Access to education was confined to the well off—and more specifically to rich males. That has changed dramatically over the last century in the wealthy countries and in recent decades in developing countries. In wealthy countries as recently as the 1960 and 1970s it was common for only 20 – 25 percent of the teenage population to stay on until the final high school years. Today the figure is more like 90 percent (eg

Statistics Finland, 2020; ABS, 2001; World Bank 2020). Similar trends have been underway in developing countries. In Africa, for example, primary and secondary education enrolments have surged from 63 million students in 1990 to 152 million students in 2013 (Bashir *et al.*, 2018). Many countries are now at 100% or close to 100% for primary enrolments, and secondary level enrolments have also been increasing, and the World Bank (2017) reports that university enrolments in sub-Saharan Africa grew faster than the rest of the world during 1970–2013, at 4.3% annually, compared to a global average of 2.8%, albeit off a very low base. Arguably the most profound change has been the rise in education attainment of women world-wide. Between the 1970s and 2015 the share of girls in primary school has risen from 65 to 90 percent (Rosling et al 2018, p. 63). In developing countries, the change has been even more dramatic, given that nearly all the change in this aggregate number comes from these nations.

The story of women's workforce participation has been more mixed. The transformation in the developed world has been profound. In advanced economies like Canada, France, UK, USA, and Australia the proportion of economically active women has increased from around one in five in the early 1900s to around three in five today (Ortiz-Ospinaand Tzvetkova 2018). The situation for women in developing countries is not as well documented and is more complex given the significance of the informal sectors in such nations. A comprehensive ILO consolidation of data from across the globe compared trends from 1992 to 2012. During this time male labour force participation rates have fallen in almost all regions of the world, from roughly around 80 percent to mid to high 70 percent during these two decades. Female participation rates have been considerably lower. They range from 50 – 70 percent in East, South Est Asia and Sub-Saharan Africa, to 12 to 20 percent in the Middle East and North Africa. While rates of female participation rose in these latter regions from 1992 – 2012, this was from a low base. East Asia, the region which started with highest female participation rates, experienced a sizeable fall: from 71.4 to 66.4 percent between 1992 and 2012 (ILO 2012: 17)

These changes are dramatically reshaping the settings in which work will evolve. In the terms of labour economics this represents a transformation in labour supply—especially its quality. Increased ageing in particular creates huge potential for both rising demand for new learning amongst people as they mature—but equally opportunities for them to share their skills, especially work-related skills with the generations coming through. The ability of people to learn and share knowledge will, of course, be highly dependent on the resources made available for this purpose, and will not be achieved if inequality and environmental emergencies continue to worsen. While women's longevity and educational attainment appear set to continue, there is nothing inevitable about their continued participation in the labour force.

Changing technologies and divisions of labour

Since the onset of mechanisation in textile production and the subsequent rise in steam power in eighteenth century Britain, profound technological change has been a defining feature of world history. Our own era is no different. Whereas early technological transformations concerned energy, chemicals, and mechanisation, the latest phase concerns an array of changes, including:

- the generation, management, analysis, and deployment of information,
- the introduction of information and communication technology (ICT) devices, AI, and 'big data' based techniques in an ever-expanding range of domains in economic, social, and political life
- combined, these developments are accelerating automation of processes that eliminate or change the nature of human involvement (including locality) in production and consumption, and are transforming social and individual decision-making.

Increasingly there are tensions between machine and human autonomy as everyday life is reshaped by these developments (Calvo *et al.*, 2020). The impact on individuals can be profound—and concerns psychological needs satisfaction and decision making (Peters, Calvo and Ryan, 2018; Calvo *et al.*, 2020). Many people are drowning in information and data, much of which has become 'noise' due to misinformation, although others still find themselves on the other side of a 'digital divide'. Those with the technology have access to information of kinds unimaginable only a generation ago. From a social perspective the key challenge is this: how do we bridge the digital divide, at the same time as making sure that people live well in a world awash with data?

From a labour market perspective, the challenges arising from technological change take a number of forms. The most overt impact has been job losses: 'the robots are taking our jobs.' (e.g. Frey and Osborne 2013; Arntz, Gregory and Zierahn 2016; and Coelli and Borland 2019). While controversy has raged over just how many jobs will (or will not) disappear, preoccupation with this issue has diverted attention from the more covert impact of ICT on the quality of life at work. Reimer and Peter (2020) have identified at least six dimensions of the deterioration in job quality arising from this source. These include increased levels of managerial control and work intensification. Additionally, automation results in a higher concentration of more complex activities to undertake (i.e. only the 'hard stuff' is left for humans to solve) and this now has to be conducted in environments where learning pathways have disappeared often because the more routine work on which they were based has been automated.

Negative changes in work quality are not an inevitable result of technology. Choices are open in how new technical possibilities ultimately structure production and jobs. The example of how computers were first integrated into manufacturing production processes in the latter half of the 20th century is instructive. In the USA design engineers, manufacturers and the US Defence Department pursued computer-based automation in a way that designed skilled labour out of the production process. By contrast, in Germany the new technology contributed to the further evolution of skilled engineering trades workers (Noble 1986). To put it simply, in the USA the ambition was to get rid of skilled machinists, in Germany it was to modernise and upgrade their role in the workplace. This example highlights the importance of distinguishing between how technology creates new possibilities in how work can be organised (or what is referred to as the technical division of labour) and how occupations ultimately emerge in practice (or what is often referred to as the social division of labour) (Murphy 1993). The ultimate configuration of jobs and occupations depends on social and political choices within the possibilities created by technology. In this context it is interesting to note the initiatives currently underway in the UK and Australia to adopt the classic trades training model of apprenticeship in the new domain of intermediate level IT workers. Employers are even considering pooling funds to support the formation of an occupation built around highly transferable skills (Cranston 2020). In other countries this kind of work is organised on more ad hoc and often firm-based arrangement.

But it is also crucial to recognise that new technology is not the only force driving changes in the division of labour. The emergence of professions like law, accounting, and teaching had very little do with technical change and a lot to do with concerns about the quality of service and scale of operation (Perkin, 1989). Ensuring public trust and accountability in an era of knowledge specialisation was crucial to this process. The clustering of tasks into identifiable domains of expertise (ie. professions) was, therefore, primarily a matter of social and occupational politics (Abbott, 1988; Freidson, 2001; Pietsch, 2016). And occupations evolve, not necessarily in ways that disintegrate over time. Nursing, for example, in many countries used to be learnt in ways akin to a trade with most education occurring on the job. However, in recent decades the push to professionalise has reduced the level of learning from work and increased the time entry-level nurses spend in educational establishments acquiring degree-level qualifications.

How work changes over the next 30 years will be shaped in part by technological change. It will also, however, be equally shaped by social and occupational politics, global value chains, and power relations between nations. Technology and organisational changes will create possibilities and constraints. Social choices will ultimately determine the outcome.

Changing levels and forms of inequality

One of the great paradoxes of recent decades has been the slight decline in income and wealth inequality *between* nations at the same time as it has dramatically increased *within* nations (Kanbur 2019). Whilst the former trend has opened up opportunities for many in the developing world, those not part of the expanding domain of production and trade have suffered significant relative decline. Thomas Picketty (2014) confirmed, in *Capital in the 21st Century*, that there is a tendency to ever increasing inequality within national economies given the difference in rates of growth of output in general and return on capital in particular. This tendency can be offset by progressive taxation, and social and wages policies. In recent decades inter-locking policies that counteracted this tendency have been unpicked in many countries. As matters stand this policy trajectory appears set to continue—and with it, inequality is likely to deepen unless countervailing interventions are entrenched (Milanovic 2019). It is striking to note that the recent and dramatic educational expansion described above has happened in tandem with growing inequality.

Inequality does not just concern income and wealth—it is also manifest in how jobs are structured and distributed. The trend to deepening inequality appears to be accelerating with the ways ICT and AI are currently being developed and deployed—and the ways the productivity gains arising from them are being distributed. Indeed, to the extent it is being used the disruptions associated with ICT and AI are intensifying trends to the fragmentation of work (Marchington et al 2004). This fragmentation has deeper roots in rapid industry and occupational change occurring an era of chronic unemployment and under-employment and a focus on short-term profit maximization (Brenner 2006). This has meant that problems of the quantity side of the labour market (i.e. not enough jobs) have facilitated a drop in the quality dimension of work. In this sense there appears to be convergence in the labour market of the developed and developing worlds. Both suffering from chronic deficient demand—and both having significant segments of low or reduced quality jobs as key elements of their labour markets (Goldberg, 2019; Dix-Carneiro et al, 2019; Sahnoun and Abdennadher, 2019).

Historically, education has played an ambiguous role in the dynamics of inequality. As has been well known education has been a key transmission mechanism for remaking wider social and economic inequalities in societies over time. Equally, however, there has been a long tradition of using education to help mitigate or even reduce the problems of inequality. Initiatives in this tradition appear to have worked best when education was embedded in wider policies that also involve tax, social and wages policy to pursue wider egalitarian programs in the social and economic domains. In recent decades it seems education—along with other changes associated with the emergence of modern meritocratic capitalism as well as political capitalism—has worked to re-make, not reduce, equalities (see especially Milanvoich 2019 for global trends; Goodhart, 2020a, 2020b for detailed study of the UK). What is particularly interesting in the current situation is how leading tech companies like Google are positioning themselves on this issue. Google has explicitly noted it wishes to disrupt established education models, with initiatives such as six-month short courses credentialed by itself, that it will recognise as the equivalent of a full bachelor's degree for recruitment selection purposes (Bariso, 2020). While it purports to have an interest in equity (i.e. 100,000 scholarship will be provided for its new micro-credentials) it has no interest in the broader legacy of its initiative for education. This is a classic case of the AI revolution amplifying a wider economic challenge. Specifically, although speaking the language of equity, this initiative will merely 'open up access' to the increasingly unequal world Google and its modern IT monopolists are helping to entrench (Kellermann and Winkler, 2019).

Section Two: Key concepts for thinking about education in changing contexts

Thinking about preparing for the world in 2050, how can education best engage with the above challenges? Megatrends do not define the future—they create opportunities and constraints. Climate change and increasing inequality generate major problems needing solutions—solutions requiring significant amounts of labour. These megatrends, of themselves, however, will not create solvent demand for labour. Social need is one thing, having resources available to meet them is another matter entirely. Changing life courses and technologies will increase the labour supply. Given the convergence of developed and developing economies in terms of deep-seated problems of unemployment and under-employment, these mega trends appear set to make a bad situation worse.

Currently fashionable ideas about education and work assert that prioritising the development of 21st century skills in the abstract and placing greater emphasis on the development of micro-credentials to meet immediate labour market needs will, to use the words of the World Economic Forum (WEF), provide 'a future of jobs for all' (WEF 2018). These popular prescriptions are part of the problem, not part of the solution. To help understand why this is the case we need a more useful vocabulary to enable analysis of current dynamics and formulate sensible possibilities for the future. Two concepts especially require close attention: labour demand and education.

Key concept 1: labour demand[3]

The first key concept is *labour demand*. This is the demand from businesses and organisations for workers, and it is determined by many factors. Education is not one of them. Instead, the ultimate source of paid employment comes from circular flows involving consumption, investment and foreign trade, supported or hindered by flows of money. These flows are shaped by policy and institutional settings. How demand arising from these sources creates particular types of jobs is conditioned by structures and networks of production (which are themselves shaped by industry and labour market policies and institutions). If there is insufficient demand for labour, the best education system in the world cannot overcome unemployment and under-employment. Demand is intimately linked to distribution and flows of income. More unequal distributions skew the character of demand. A long-standing feature for much of the developing world has been insufficient labour demand relative to the amount of labour available. Widespread and chronic unemployment and under-employment have defined these labour markets, as is evident in their large so-called informal sectors. In developed and many middle-income countries problems of mass unemployment and under-employment have been rising in recent decades. With the onset of the COVID-19 crisis this problem has worsened significantly. This threat of deficient labour demand is a reality that we ignore at our peril.

The best education systems in the world cannot overcome problems of labour demand. While education has helped to shape jobs, it has virtually no role in determining overall levels of employment. The case of women's work in wealthy countries is instructive. The massive rise in women's levels of educational attainment over the course of the 20th century was a precondition for them taking on more and better work in the second half of the twentieth century. But their increased workforce participation required (a) massive shifts in the full range of laws and customs limiting women's work rights and (b) the surge in demand following active Keynesian policies 1945 – 1975 (see Nolan 2000 for an excellent analysis of this dynamic in New Zealand).

Key concept 2: education as a distinct domain[4]

Our second key concept is *education.* While some learning happens everywhere, the point of education is to provide access to knowledge and skills which are not typically gained in the course of everyday life. For good reason education takes different forms during childhood, teenage and adult years. Effective learning, especially beyond childhood, requires deep engagement by the student in specific domains. Learners master a host of specific bodies of knowledge and techniques and understand the connections and relationship between knowledge domains. They also generate dispositions for learning and building from mistakes as well as successes. Nurturing learning dispositions, building up capacities to read and write, mastering particular disciplines or fields of vocational knowledge, takes time and careful activity. This does not happen purely individually or spontaneously, except in exceptional cases (Vygotsky, 1978). At their core these are relational and collaborative experiences. Fundamental learning dispositions are nurtured in the early years. These concern things such as focus, grit, curiosity, influence, empathy, teamwork as well as cognitive abilities such as making and expressing meaning. As they mature students need to be introduced into domains of knowledge and skill in a sustained way, gradually acquiring greater levels of conceptual depth and breadth as they continue developing dispositions for learning. This requires well-planned and structured educational programmes. Education is a fundamentally social activity, requiring the guidance, leadership, curation, and direction of skilled, teaching professionals, and embodied social interaction between students that creates excitement and emotional energy associated with areas of knowledge that enables students to learn further on their own.

The academic discipline and profession of education has emerged over the centuries to provide guidance as to how best to achieve this, and education systems have developed and been cultivated as the best institutions in which this sustained and structured activity can be nurtured. The workplace can also be a site of learning—but it is only one, and generally it is a good one when highly specific tasks and habituation to work need to be learnt. Workplaces are also important places in which specific domains of expertise are developed—but, such expertise, acquired by active participation in working communities, is built on bodies of conceptual knowledge acquired in education institutions as well as practice in occupational field (Clarke and Winch, 2004; Winch, 2010; Guile and Unwin, 2019). Recognising the significance of education as not only an important, but also as a *distinct,* domain*,* and a domain which requires specialized institutions, is central to our analysis. It is the integrity of this distinct domain that is too often overlooked in contemporary narratives concerning the future of work with its pre-occupation with 'work-ready skills'.

What education cannot do

Curriculum reform and skills training programmes are frequently posited as critical for providing 'bridges' into a world of formal employment. The key problem with this habit of thought is that it neglects the importance of issues associated with the economic context in general and labour demand in particular. First, in many developing economies few formal jobs exist. Building a bridge in this context means little more than engaging more effectively with the pre-existing informal economy, not creating better jobs. Second, where formal employment does exist, it often does not lift people out of poverty. As development economist Alice Amsden (2010) argues, in the presence of high unemployment at all levels, improving the capabilities of job seekers (such as feeding, housing and educating them better) will only lead to more formal unemployment and not to more paid employment or self-employment above the subsistence level. Amsden points out that it is often held as an

> … article of faith that a supply of better clothed, housed, and fed workers automatically creates the demand to employ it at a living wage. Yet if unemployment already exists, then to invest more in workers' human capabilities, whether in the form of healthcare, housing, and schooling, or of political freedom, democracy, and transparency (as the Nobel laureate Amartya Sen suggests),

> may create more perturbed unemployed job-seekers, rather than more plentiful jobs' (Amsden, 2010: 60).

This is not an argument against policies that prioritise the development of human capability. Rather it is to state the obvious: improving human capability in general and education in particular will do little to create more jobs in the absence appropriate levels of effective labour demand.

Section Three: What education can do (positively and negatively)

While education cannot overcome problems of deficient demand, it can and does perform other critical social and economic functions. Three functions are particularly important. The first is creating a population of well-educated people. Well-educated people are good for the economy as well as society. The second is the role education plays in supporting and structuring new—as well as established—domains of expertise. The third concerns the provision of quality credentials that help with coherent educational and occupational progression.

Before considering each of these matters it important to note two fundamental realities. The first is that education does not function in isolation. While educational initiatives cannot make up for deficiencies other in other realms of policy, this does not mean these other realms of practice do not impact profoundly on it. The issue of inequality is particularly important and, indeed, is pervasive across all three core functions. The second is that even if education is respected as a distinct role (ie more than merely a handmaiden to meeting the alleged needs of the economy), this does not mean education will work as a manifest human good. There is 'good' and 'bad' education. So, while respecting that it has a distinct role to play and is a vital prerequisite to getting policy in this area correct, careful consideration needs to be given to how best to design and operate education as a domain of social practice in its own right. In this section, consideration is given especially to how education develops citizens in the context of changing dynamics of inequality. The fourth and final section outlines key ideas to guide how education can work to achieve positive outcomes, even a situation of deep and deepening inequality.

Educated citizens are good for society (the economy included)

Economists have long recognised that a well-educated population is a public good—as a group we all benefit from people being better educated. At its best education can foster self-reliance as well as social solidarity and enables communication—vital preconditions for a sustainable, well-functioning community and economy. Recent changes make this feature of education as true today as ever. Reflections on the challenges of AI are useful in this context. The explosion of data creates huge potential for the spread of misleading as well as reliable and useful information. Significant transformations to the technological environment enabling ubiquity, immediacy, and considerable anonymity, have facilitated the spreading of misinformation in unforeseen ways (Wardle and Derakhshan, 2017; Piccolo *et al.*, 2019). Giving people the capacity to discriminate between the two is not easily achieved (Thorson, 2016). Part of the educators' long-standing interest is to develop confident, creative, critical, and independent thinkers. If education is to deliver on this core mission, resources will need to be devoted to establishing quality education systems.

When thinking about the future it is important that realism informs analysis. The positive potential role of education is widely accepted as highly desirable. The reality of education, however, often falls considerably short of this ideal. For many, education is a painful (or at least unsatisfying) experience where they are branded as not

very bright and sorted for placement in increasingly unequal labour markets. The growing literature on the problems of liberal meritocratic capitalism has highlighted how education, especially as key elements of it are privatised and marketized, is integral to reconfiguring and deepening inequality. Not only is access to quality education increasingly difficult in this emerging form of capitalism, but education at secondary and university level is used to legitimise inequality by effectively attributing low labour market outcomes as attributable to inferior educational attainment. As Milanovic (2019, p. 60) puts it:

> The high cost of education, combined with the actual or perceived educational quality of certain high-status schools, fulfills two functions: it makes it impossible for others to compete with top wealth holders, who monopolize the top end of education, and it sends a strong signal that those who have studied at such schools are not only from rich families but must be intellectually superior. (Milanovic 2019: 60; see also Sandel 2020; Goodhart, 2020a, 2020b; and Mandler 2020)

Authors such as Thomas Frank have argued this modern-day reality has shifted political resentment against 'educated elites' as has been evident in the so-called right-wing populist mobilisation around the world, most starkly evident in the ascendancy of the Trump administration in the USA (Frank 2016, 2020). 'Well educated citizens' in this kind of context is not so much about giving a population the best a society has to offer in terms of understanding and the ability for confidence and independent judgement—is more about legitimising inequality. Increasing disquiet about education in the era of liberal meritocratic capitalism has nurtured a number of unhelpful proposals for education reform. There is a stereotype that education systems have not changed since the industrial revolution. The extensive histories of education, especially comparative education, demonstrate that this is wrong empirically (Pietsch, 2013; Campbell & Proctor, 2014; Goodman, McCulloch & Richardson, 2008). It is the case that in some parts of the world there are survivals of, and retreats into, unimaginative models of education based on tightly scripted classes for teachers and extensive rote learning by students. But this model enjoys little research-based credibility and is not supported by most professional educators. An equally unhelpful development has been the global campaign focusing on the so-called '21st century curriculum'. Such impetuses can be seen to re-emerge repeatedly in educational reform partly because of the recurrence of narrow rote-learning based approaches to subject teaching, and partly because of a belief that specifying 'skills' needed will lead to their being integrated in curricula and taught. Such advocates—usually consultants and economic policy makers— usually have limited professional expertise in the education domain. The focus is then on endless identification of the latest type of skills, which usually turn out to be very similar to the skills identified in the previous round. The attributes of interest (e.g. creativity, collaboration, problem-solving) are best acquired in the process of developing competence in and between specific domains of either academic or vocational/professional knowledge. They cannot be mastered in the abstract. Further, the preoccupation with 'skill identification' neglects the hard work of structuring curricula to encourage broad disciplinary understanding (a holistic and diverse education), conceptual competence, and, as we note in more detail in section 4, neglects issues of building vibrant institutions including professional staff, as well as the broader social conditions that make education more successful—nutrition, clean air, and so on. In short, frustrations arising from the negative consequences of liberal meritocratic order should not legitimate ill conceived 'education reforms' direct at 'making education work better for work'. Doing so runs the real risk of undermining education's capacity to do what it can do well, which is (as noted above) nurture confident, creative, critical and independent thinkers.

Knowledge is necessary for building new domains of expertise

From a labour market perspective, recent developments in AI and digital technologies create huge challenges and opportunities for expertise in the workplace. The impulse amongst a growing number of consultants and education policy makers is to push the fragmentation of education (e.g. give greater prominence to 'micro credentials') in the hope that this will support the new configurations of skills made possible by AI. This is not the

only possible response. It is useful to reflect on the introduction of computers into manufacturing in the latter half of the 20th century noted earlier (Noble 1986). This involved technological change that allowed for new possibilities in how tasks could be eliminated, redefined and potentially re-organised (i.e. new options concerning the technical division of labour). What prevailed, however, was determined by social power. As discussed above, in the USA it resulted in the undermining of skilled machining as an occupation, while in Germany it contributed to the occupation's modernisation; in other words, the outcome was ultimately determined by the social division of labour.

Education cannot determine which choice prevails. It can, however, play an important supportive role in providing potentially relevant underpinning knowledge for emerging trades and professions. This is the hallmark of all recognised trades and professions today: within a framework regulated by the state, practical skills and know-how are learnt on the job, and the relevant underpinning knowledge is provided by educators (Winch, 2010). Effective organisation of new domains of expertise requires effective organisation of knowledge both on- and off-the-job. Educators cannot do this on their own. While they have an indispensable role to play in the 'off-the-job' element, supportive change also needs to occur in the labour market, and regulation and registration overseen by the state. In this sense education is a necessary but not sufficient condition for developing new domains of expertise. As noted below, how new domains of expertise are defined and organised is an outcome not just of effective approaches to education—it also requires effective modes of multi-employer and worker coordination in labour markets and action by the state in determining how domains of expertise are defined and which require formal credentialing before people can practice in them.

Quality credentials depend on social relations – not just the formalities

Credentials are the place where education and labour markets meet. They perform social as well as educational functions. They serve as a signal about social status as well as certification of the mastery of a body of knowledge. This latter role supports societies in allocating people to jobs for which they are well equipped. However, credentials do not only indicate potential productivity, they can also be screening devices for employers. To the extent that credentials are used for signalling or screening in labour markets, they are positional goods. The significance of positional goods changes as their supply falls or rises. Supplying more education to more people can increase the role education plays developmentally, by providing more people with the opportunity to learn. This has led to a crisis in the context of economies that are increasingly structured for winners to take all—with increasingly fewer jobs for the educated to access. In such a context, increasing the supply of education cannot increase the positional gains previously associated with achieving particular educational levels. Competition for this positional gain leads to qualification inflation, whereby potential workers are obliged to strive for higher and higher levels of qualifications to improve their place in the job queue (Dore, 1976; Collins, 1979). This leads to impatience with credentials, and accordingly, impatience with education provision. The resentment arising from the inequality associated with liberal meritocratic capitalism was noted earlier. Equally troubling is the response of some businesses. Google's proposal for a six-month degree is symptomatic of this. It proposes to obtain the skills needed 'just in time' through much shorter training. This impatience can also be seen in the growing interest in 'micro-credentials'. It is also evident in the general focus on qualification reform that focuses on 'specifying the end product' without understanding (or respecting) the social processes and interactions and institutions that are at the core of education. All of these developments are based on flawed assumptions that simply changing 'product specifications' is enough to change quality skills development and shape educational opportunities.

Ironically, these phenomena tend to reinforce the problems they seek to address. The more governments emphasize qualifications as an instrument for controlling quality and relevance, the more educational providers (and teachers and students) will treat qualifications as ends in themselves rather than just as an element in the

system to help with quality. Inevitably, this aggravates the problems of credentialism and credential inflation. Qualifications are always only 'proxies' for what someone knows and can do; hence the crucial role of trust and the link between trust and purposes. In the vocational and professional domains, the great advantage of the older order was the trust in the qualifications that were built up over time between employers, trade unions, students, assessors and educational providers in those sectors. The main limitation of the old systems of qualifications was that in many countries, they only addressed the needs of a small section of the workforce. With the rise of mass schooling and higher education, educators need to constantly work to highlight the value of quality education conceived in terms outlined in section 2.2 above. Changes in the structure and demands of labour markets has meant that the typical bases of trust—the stability of occupational communities—have been eroding. New forms of trust will need to be established. Vocational and professional educators will need to engage with labour market stakeholders and engage with—and help constitute—new job clusters or occupational streams and new forms of occupational communities associated with them to ensure the legitimacy and relevance of vocational qualifications in the future. How this can occur is considered in section 4.3 below.

So education can in fact make a big difference—but not of the kinds commonly attributed to it in the 'education as economic salvation narrative'. That difference can be both positive (creating well informed and independent minded citizens) or it can be effective in a very negative, instrumental sense: helping allocate people to new configurations of inequality. While it cannot overcome inequality, it can still help to create better citizens. Suggestions on how it can play a positive role, even in the context of increasing inequality and rapidly advancing technological change, are outlined in the final section.

Section Four: Implications for policy

The 'new', 'disruptive' design principles currently getting much traction—such as '21st century skills', 'micro credentials', and 'responsive providers' (including for-profit organisations and people being able to become 'educators' with limited preparation)—amount to a de facto de-institutionalisation and de-professionalisation of the education domain. Against this we propose a suite of ideas and policy directions concerning education's role in the broader policy mix, the importance of non-market forms of institutions, the need to nurture occupational coherence in the labour market, and distinct design principles for the different sub-sectors of education. They should be regarded as points of departure for policy thinking, not prescriptions to be followed in any setting. Effective policy design requires a deep understanding of the legacies bequeathed from the past. Any specific intervention should start by building on and strengthening the best of what is already there in different contexts.

Education and the broader policy mix

The current COVID-19 crisis has unsettled old orthodoxies about the policy choices open to many countries. There is increasing recognition that fiscal policy has the central role to play in job creation in situations of mass unemployment and under-employment. There is also a recognition that certain previously undervalued forms of work (e.g. care work) are crucial to societal maintenance. It is clear that markets have not proved an adequate basis for determining the public good. What is required now is more ambition and more focus in how education fits into the overall policy mix. Instead of mistakenly expecting it to make up for the deficiencies in other policy realms, all realms of policy should be arrayed to nurture more highly educated citizens. The focus should not be on short-term 'employability', as per the Google six-month degree, but in creating a knowledgeable citizenry. Education should be a central element of a policy mix committed to deepening social development more

broadly. Education can also support the development of new domains of expertise in ways that augment coherence (and reduce fragmentation) in the labour market.

The rest of this section identifies the key organisational principles that should guide policy-makers interested in nurturing education systems that are part of a more human centred approach to economic and social development.

Education and agile stability

Work on innovation in industrial production and technology demonstrates that a pre-occupation with flexibility and responsiveness has often neglected consideration of their institutional preconditions: strong institutions—often working in clusters—and patient funding. This means moving beyond short-term market solutions as the quick fix for innovation. Mariana Mazzucato (2013), for example, shows how venture capital has not been the key factor in many major industrial and technological innovations but, rather, patient capital through nation states (including in the military industrial complex in the United States) has played this role. Kattel et al. (2019) use the term 'agile stability' to emphasise the combination of strong and stable institutions and innovative partnerships in organisational agility. What does this mean for education and its role of engaging with different futures of work? It is uncertain how demand in the economy will change. It could well come to pass that more skilled workers are needed. Equally, labour markets could continue to casualize and fragment in rich countries and remain informal and survivalist in poor countries. No matter what eventuates, education needs to maintain its institutional and conceptual coherence as a set of societal structures created for the development and acquisition and application of knowledge and learning dispositions. This requires professional labour conditions for educators. Arrangements that give educational professionals the time, resources, support structures, and employment conditions to develop and perform as inspiring teaching professionals are also essential. Also necessary are conditions of employment for teaching professionals that support their work—stable job contracts with adequate remuneration and conditions of employment.

Education and expertise: handmaiden to labour market fragmentation or occupational citizenship?

The skill content of work has changed profoundly in the past and will do so in the future. While change is certain, how skills, tasks, and careers are configured are not. Distinguishing between jobs and occupations helps clarify the issues at stake (Standing, 2009). A job is a bundle of tasks performed by a person in a particular role in a particular organisation. When thinking about the future it is critical that aspiration moves beyond seeking 'more and better jobs' in some undifferentiated way. On the contrary, it is vital to identify the kinds of occupations that a society nurtures and develops. Occupations are defined on the basis of coherent ensembles of skill. These can be defined in ways that nurture transferability or in ways that lock work-related skills to the specific needs of a particular employer (Marsden 1986, 1999). Historically transferability of workers between employers on the basis of widely recognised trade or professional skills held by workers has defined occupational labour markets (OLMs). Typical examples are professions like medicine and licenced trades like electricians. Internal labour market (ILM) has been the term used to define organisation-based skill regimes. In recent times both types of labour markets have been in decline as employers have pursed 'flexibility'—which in reality has been fragmenting work (Cappelli, 1999; Rubery and Grimshaw, 2002; Osterman and Burton, 2006). But fragmentation has not been inevitable. The contrasting example of skilled machinists in the USA and Germany was a case of contrasting approaches to how the evolution of an established occupation has been handled (Noble, 1986). The case of an emerging apprenticeship for ICT workers in Australia (Cranston, 2020) is an example of an occupational dynamic at work in an emerging domain of expertise where companies like Google are endeavouring to established proprietorial approaches to skills development.

In thinking about the future, it is important to engage with the emerging interest in the dynamics and educational opportunities associated with job clusters (WEF/BCG2018, Centre for New Economy and Society/BCG 2019) or vocational streams (Wheelahan, Buchanan and Yu, 2015). This work is exploring how experience in one type of job or occupation can prepare people for potential movement into multiple other types of work, based on the fact jobs and occupations share many common or adjacent skills. Two responses from education are possible to this. In response to this, employer and consultant-driven analysis argues the reality of this tacit transferability highlights the need for so-called 21st Century skills supported by micro-credentials to impart new competencies as people move between jobs (eg WEF 2015, Australian Foundation for Young People, 2017). By contrast, researchers working in the institutionalist and labour market segmentation traditions have identified another possible response (Geel and Backes-Gellner 2011, Wheelahan et al 2015). Detailed work on the Swiss apprenticeships system, for example, has highlighted the transferability of advanced problem solving and other skills acquired in the course of completing training in watch and clock-making trades. Skilled workers in these trades can switch with ease to other industries, such as the medical devices sector, building on the deep expertise acquired in their home trade.

What role then is education to play in shaping the way expertise is organised at work in the future? The simplest option would be to continue the current trend toward fragmenting skills and prioritise the development of so-called micro-credentials by parcelling out skills training as needed. We suggest this option will be self-destructive in the medium and long term. More ambitiously, education could support the deepening of the capacity of people to move between related occupations by reconstructing qualifications to support what Wheelahan et al (2015) call vocational streams. The case of intermediate-level modern service work is a good example of how this could occur. Analysis of inter-occupational labour flows has established that workers are rarely fixed in the roles of care or clerical or customer service work all their working lives (Buchanan et al 2019). Instead, many such employees flow between these different types of work in the course of their careers. There is, potentially, a domain of modern service work encompassing all three areas. Effort needs to be devoted to identifying what domains like this are, who should be part of the community of trust governing them and how they should be supported by the state, educators and employer bodies (Yu et al, 2012a; 2012b; 2013; 2014; 2015). This is where UNESCO could undertake important developmental work with the ILO in not just responding to the challenges of the future of work—but rather helping to identify and provide insights into potential new domains of occupational citizenship.

The need for appropriate design principles of different parts of the education system

In thinking about education and work, inevitably we have to consider the role of different parts of education and training systems, and the different roles that they play. This includes the question of where specialization is introduced. Here, there is another paradox: education systems tend to be either too close to, or too far from, work. In terms of schooling, particularly secondary schooling but sometimes even primary schooling, especially in poor countries, reformers try to push curricula to be closer to work, in the hope that this will prepare young people for workplaces and livelihoods. In contrast, in most countries, especially poor countries, vocational education and training systems tend to be very small with weak links to workplaces—conceptualized as separate entities that 'supply' trained people to meet the 'demand' of the economy. Reformers have attempted to bring education closer to work through curriculum reform driven by competence statements or occupational standards. In both cases, the possibility of valuable education in its own right is undermined, and, systems based on 'competence-based training' have not produced the kinds of workers that employers claim to value. What are more appropriate points of departure to position education appropriately for the potentially very different futures of work that are possible?

Autonomy, especially in primary and secondary schooling

We re-emphasize the notion of *autonomy* for education as a distinct domain. We argue that the education provided in schools—the education that the vast majority of young people access—requires autonomy from the domain of work. They are, inherently, two separate domains. This does not mean that there should be no vocationally oriented subjects in schools but that the everyday world of work tasks cannot be the starting point for curricula. Tasks performed in everyday life are learned in everyday life—they cannot be the main focus of education. The role of education is to step out of, aside from, everyday life, and develop the knowledge, concepts, and skills to reflect on, and analyse it. This requires a degree of distantiation between education and everyday life. Education enables people to acquire and contribute to the development of the bodies of knowledge about the natural and social world that have been developed by humanity over time and are the birthright of all people. Combinations of general and specialized education are needed, which provide a clear curriculum design principle combining distantiation and instantiation at each level of progression. This autonomy stands a greater chance of producing individuals better able to cope with the different and increasingly unpredictable demands of work and life. Bequeathing strong levels of literacy and numeracy, acquiring and contributing to the development of bodies of knowledge, and developing interpersonal, intrapersonal, and cognitive learning dispositions are complex and time-consuming tasks. In a world saturated with increasing amounts of data and ICT, equipping people with critical capacity to engage with information technology and its various outputs is a vital role for education.

Embeddedness for Vocational Skills Development

By contrast to school systems, technical and vocational education and training systems as well as the variety of forms of provision that develop vocational skills must be *embedded* into industrial, social and especially professional/occupational development. Decisions about industrial transformation and skills are inter-related and vocational skills development cannot be seen as exogenous to a wider outlook on and policy for industrial development and growth. Professional education takes place within the auspices of professional associations, as well as building on knowledge and traditions of scholarship that have been developed over centuries. Technical and vocational education and training (TVET) systems should do the same. The provision of vocational skills development in all its various forms needs to be conceptualized as part of a wider industrial and social and occupational/vocational stream development trajectory taking into account the overall direction of specific industrial sectors as well as the specific dynamics of workplaces. This may mean that TVET systems are very small—where there is very limited real demand for technically trained workers in the economy. Policy makers may have to abandon the idea of mass TVET as the solution to unemployment. Absolutely central to quality vocational skills development is having effective communities of trust that involve all stakeholders with an interest in particular job clusters – or what we describe above as 'vocational streams'. As a minimum, such communities of trust should include employers, worker representatives, professional/vocational association, educators as well as relevant government officials (Wheelahan et al, 2015; Yu et al 2012a; 2012b).

Knowledge-education nexus and the role of higher education

The development and acquisition of knowledge are core to the intelligibility of education as a social domain, with specific implications for education institutions and the possible roles for education in society and the economy. In particular, in terms of knowledge development, any quality education system must include higher education institutions such as universities and institutes of technology. For an effective system in the future they will need to be integral, but not overbearing. In many countries, academic approaches to knowledge, narrowly defined, play a limiting role in the diversity of educational offerings, especially in the structuring of final high school exams. We must be careful, however, not to throw the baby out with the bathwater. Higher education

institutions play a key role in knowledge creation—as well as higher level knowledge acquisition. This knowledge, and its utilisation and adaptation, is vital to human progress. In thinking about the future this core function must be respected and broadened. Various professions have ensured expertise was developed and refined with the assistance of universities. As new domains of expertise emerge universities must continue to play this role. This is already taking place in the rapidly expanding field of data science (National Academy of Sciences, Engineering, Medicine, 2018), but it is also being contested by the emergence of new credentialling bodies such as Google. Higher education institutions also have a key role to play in developing teachers at all levels of the education system.

Surge capacity for 'short course'/ responsiveness

Finally, there are instances in most countries where certain sectors of the economy experience growth and have immediate need for specific skills. In such cases, the notion of 'supply and demand' as conventionally used in policy is appropriate. But this 'supply' can only happen in the context of agile stability, as discussed above. This point applies most strongly to TVET institutions, which are traditionally given the bare minimum of funding, with the expectation that market demands will lead to short-term responsiveness. In practice providers have no capacity to respond when there are short-term urgent requirements—such as reskilling workers who have lost their jobs because of COVID-19. Education institutions need enormous capacity to be able to respond in an agile manner to short term labour market demands. Hence the need *for surge capacity in the system*. To have the ability to respond quickly to the unexpected you need strong, enduring institutions. Such institutional capacity cannot be built up the instant the crisis emerges.

Conclusion

When thinking about the future of work and education there is a choice: persist with the widespread contradictory habit of thought that expects both too much and too little of education—or focus on what education can do well. Building up quality education systems with well qualified, supported, and respected teachers cannot, on its own, transform the world. It can, however, ensure people's learning dispositions are well cultivated early in life. A quality education can nourish individual's cognitive, interpersonal, and intrapersonal capacities, and enable people to master domains of knowledge (and relationships between them) that offer our best insights into understanding the natural and social world. It can underpin the capacity for skilled work, independent reasoning, and collaborative action. Combined, these foundations support people's ability to engage critically with the increasing amounts of information and ICT flooding many aspects of our lives. Striving to establish such quality education systems would provide a clear reference point for economic development. If this is pursued as a priority, all other arms of policy could then be configured to help nurture highly educated, productive citizens. The socio-economic conditions that structure learners' lives as well as those of their families and communities must, for most people, substantively improve in order to improve equality of learning. Privatisation and marketisation of education is moving us in the wrong direction. In many countries this is increasingly entrenching the problems of liberal 'meritocratic' capitalism noted earlier. There is nothing wrong with merit, provided societies are not structured with only a few winners, and provided cognitive achievement is not the only type of merit considered.

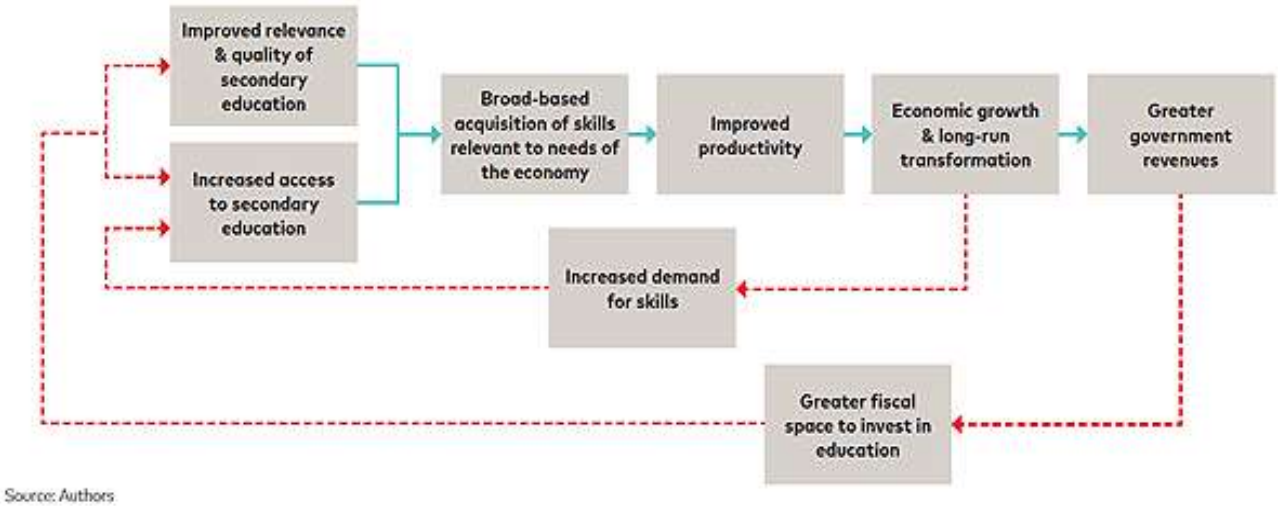
While education is not 'the answer' to the challenges of the future of work, there can be no answer to the challenges without a quality education system. Hence, our core focus is on 'bringing institutions back in' to the policy focus: building strong, enduring education institutions as the anchor for quality and innovation in the

education domain; and collaborative, 'quasi-professional/trade based' ones in the labour market (i.e. the communities of trust/practice). And above all, we argue the focus of education interventions must shift away from the red herring of which 'skills' are needed—whether '21st century skills', 'employability skills', or any other kind. Nor is there a need for 'big idea' curriculum reform. It is not 'skills in the abstract' that we need to be preoccupied with, but skills that form part of the whole (bodies of knowledge), and cultivating the institutions in which these bodies of knowledge and skill can be developed – and genuinely available to all. Policy focus must, therefore, be on building, nurturing, and supporting strong, vibrant, agile and inclusive education institutions. No matter what future of work comes to pass, educational arrangements built on these principles will nurture not only individuals but whole societies with the capacity not merely to adapt to changing circumstances – but to also help shape them.

Notes

[1] For some examples, see Mastercard Foundation (2020) and World Bank (2015). While these reports do not deny the importance of other social and economic policies, they overemphasize what education can do, as captured in the following diagram, which appears in the first report:

FIGURE 1.2
LINKING SECONDARY EDUCATION WITH ECONOMIC GROWTH AND TRANSFORMATION



Source: Authors

[2] See for example Bashir et al (2018) who focus exclusively on addressing in-school factors in order to address the 'crisis of learning' in Africa.

[3] There is a huge literature on labour demand. Its importance for economics in modern times was established by John Maynard Keynes (1936). Simultaneous work was also done by Kalecki (1971) identifying its importance in modern economies. Over the last thirty years, especially in the English-speaking world, the pre-occupation has been with so-called supply side approaches to economic development in general and labour market development in particular. The Global Financial Crisis (GFC) broke the ascendancy of this latter habit of thought – but only a little. The period of fiscal retrenchment and austerity soon after the massive monetary and fiscal policy intervention around that crisis ended up prolonging the crisis. For the definitive work on this, see Tooze

(2019). With the onset of the Covid 19 crisis some actors appear to have learned the lesson that premature retreat to supply side priorities (e.g. balanced budgets) can be counterproductive (e.g. the UK in Brexit and the Trump ascendancy in the US). See for example the recent OECD *Employment Outlook* (OECD 2020). For an extensive archive of research amongst education and skills specialists who have built a research program around taking labour demand as their central concern see the work of researchers Ken Mayhew and Ewart Keep at SKOPE http://www.skope.ox.ac.uk/news/. A consolidation of international research informed by this approach is provided in Warhurst et al 2017. The work of the labour market segmentation school is also highly relevant to the issues covered in this paper. See for example Botwinick (1993); Fine (2013); Rubery and Grimshaw (2002); and Grimshaw, Fagan, Hebson, and Tavora (2017). Labour demand is not the only broader 'context factor' that should be taken into account to ensure the role of education is properly appreciated as a factor shaping economic and social development. A very useful, cross-country analysis with data from 130 countries studied over a 30-year period is provided in Mahmood (2018). In a nutshell this analysis highlights the importance of understanding the composition (and not just the quantity) of growth, the quality (and not just the quantity) of jobs and the need to ensure physical capital grows as quickly as human capital if an adequate set of policies is to be devised to nurture sustainable, inclusive growth.

[4] There is a substantial body of literature on the issues discussed in this paragraph (for example, Vygotsky, 1978; Dewey, 1986; Bernstein, 1996; van der Veer and Valsiner 1991). For secondary schooling see Young (2007). For vocational education see Wheelahan (2010), Allais (2014), Allais and Shalem (2018), and Gamble (2013). For higher education see Collini (2012) and Connell (2019). It is important not to confuse learning disposition with 21st Century Skills. For an explanation of the difference see Buchanan et al (2018: 28 – 30), Jefferson and Anderson (2017), and Deakin, Crick and Goldspink (2014).

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