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Credentialing micro-credentials

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Abstract

The core purpose of accrediting educational credentials is to establish their conformity with standards established for educational credentials in general, particularly those offered by other institutions and in other fields. Educational accreditation integrates educational credentials within a network of all other educational credentials and their processes for assuring standards and quality. These processes are essentially conservative, being designed to minimise the risk of a failure of standards or quality. There are also pragmatic obstacles to recording multiple credentials from different sources within education's accreditation system. In contrast, the recognition of expertise in employment is embedded within employment. The core criterion for the recognition of expertise in employment is the practitioner's integration within a specific field of practice if not a site of employment. Comparability, and still less similarity of practice with other fields and sites, is irrelevant to the recognition of expertise in employment. Inasmuch as micro-credentials seek to develop employability they are markedly different from programs that develop educational knowledge and skills. While such micro- credentials may be recognised in employment, they seem incompatible with educational accreditation. The little evidence available is that micro-credentials do not have strong employment outcomes. Micro-credentials seem unlikely to address inequality in higher education which reflects deep and pervasive inequalities in society, and seem unlikely to strengthen links between education and work which depends as much on the structure of work and the labour market, and the cognitive content of jobs.

Keywords: micro-credentials, accreditation, short courses, employability

Introduction

Micro-credentials have displaced massive open online courses (moocs) as the portmanteau higher education reform elixir. Moocs were first established in 2008 by the Canadian professors George Siemens and Stephen Downes whose course connected networks (Siemens, Rudolph, & Tan, 2020, p. 109) of distributed open resources (Downes, 2012). These connectivist moocs, abbreviated c-moocs, were displaced in popular imagination by x-moocs (Bates, 2014) which are instructionist (teacher-focused, skills-based, product-oriented, non-interactive, and highly prescribed) (Johnson, 2009, p. 90) many of which are little more than a series of short videos and automated assessments (Bates, 2014). Around the height of their popularity in 2012, 'the year of the mooc' (Pappano, 2012), Friedman (2013, p. 2013) claimed that *Nothing has more potential to lift more people out of poverty*

than moocs, and similarly extravagant claims were made that moocs would disrupt universities' business model and make higher education radically cheaper (Hollands & Tirthali, 2004). Moocs failed to meet the claims made for them because their developers misunderstood pedagogy (Moodie, 2016), because they wilfully ignored the previous expertise on online education (Bates, 2014) which moocs were going to 'revolutionise', and they ignored the experience of fellow elite universities with similar extravagant proposals to establish online universities during the dot com boom just a decade earlier.

A decade after peak mooc, micro-credentials have updated real, exaggerated and confected issues to address, but the evangelical tone remains. Worried about getting work in a world disrupted by a supposed 4th industrial revolution? Frustrated by higher education's misalignment with employment? Impatient for a quick fix to the under representation of equity seeking students in higher education? Exasperated by the recurring failure to cut higher education's costs radically? Determined to disrupt higher education's institutionalisation? Micro-credentials have been promised to solve all these real (Howley, 2010, p. 6; Hollands & Tirthali, 2004) and confected problems, and more.

For example, a post for the Brookings Institution argues that partnerships between online education and employers which involve employers certifying groups of courses as meeting industry's standards for skills and knowledge 'is likely a game-changer' and 'essentially an end-run around traditional accreditation as a measure of quality' that will be a 'radical shakeup of higher education' which 'holds the prospect of far less expensive and more customized degrees that are more in tune with the recruiting needs of major employers' (Butler, 2015).

It seems that we haven't reached peak micro-credentials yet. Google trends reports the popularity of search terms entered in Google from January 2004 to the present. Brown, Mhichil, Beirne and Mac Lochlainn (2021, pp. 229-230) found in their June 2021 search that the term 'microcredentials' first appeared in Google search results in 2013. Our search in March 2022 found that 'microcredentials' first appeared in Google search results in May 2009, that 'micro-credential' first appeared in October 2009, 'microcredential' in February 2014, and 'micro-credentials' in August 2015, with searches for all terms still increasing at the time of the search or recently (Figure 1).

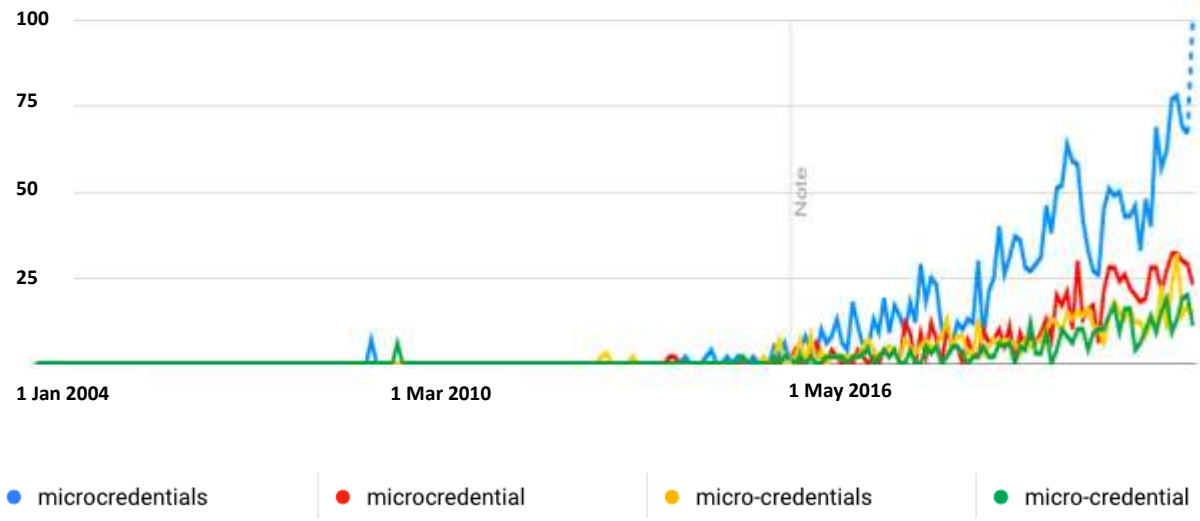

Figure 1: Number of Times 'microcredentials' and Cognates have been Searched in Google from January 2004 to March 2022

Source: Authors, from Google Trends
Note: Google improved its data collection from 1 January 2016

We have argued against the debasement of education by micro-credentials (Wheelahan and Moodie, 2021a), against their facilitation of the precarity of the gig economy (Wheelahan and Moodie, 2021b), and we have argued that they are part of the fetishisation of skills as a consequence of their degradation by human capital theory which underpins education policy (Wheelahan, Moodie, & Doughney, 2022). Here we describe the characteristics of the systems and structures for accrediting, assuring quality and recording substantial credentials, which would be pressured and possibly compromised if they included micro-credentials in the very big volumes advocated or implied by their proponents. We argue that inequality in higher education has much deeper and broader causes than may be substantially reduced by micro-credentials and moreover, that micro-credentials have the potential to compound existing inequalities if they are regarded as an alternative to substantive qualifications for those who are already disadvantaged. And then we elaborate the irreconcilable differences between the recognition of educational expertise by educational credentials and the signalling of employment expertise which is sought for many micro-credentials.

The paper starts by reviewing legacy short courses offered by universities, non-government organisations and businesses, and notes policy makers' interest in having micro-credentials accredited by formal qualifications frameworks or universities. The paper then describes universities' accreditation as linking credentials with a network of other educational credentials and quality assurance processes. This it contrasts with the recognition of expertise in employment which is based on the practitioners' integration within a specific field of practice. The paper argues that these two forms of recognition are incompatible. The paper observes pragmatic difficulties with recording multiple credentials from different sources within existing educational credential records. The paper then argues that inequality in education reflects deep and broad inequalities in society, which are unlikely to be addressed by micro-credentials. The final substantial part of the paper reports studies finding that micro-credentials do not increase holders' employment outcomes substantially, and argues that they are unlikely to do so.

So what's new?

Universities have been offering certificates for short courses for centuries (Larson, 1957, p. 31). Typically these are offered outside standard accreditation, quality assurance and financing arrangements, but are offered within universities' authority as autonomous self-accrediting institutions. Some are funded mostly from institutional resources as part the institution's contribution to lifelong and community education; others contribute to continuing professional education and are funded mostly from tuition fees. Some are offered by faculties directly, some are offered through faculties' dedicated continuing education units, and some are offered through a central continuing education unit. Thus, Polanyi (1944/2001, p. xl) wrote *The great transformation* while he was a lecturer for the Extramural Delegacy of the University of Oxford which had been founded in 1878, and while he offered tutorial classes for the Workers' Educational Association which was founded in 1903.

The St John Ambulance Association started awarding certificates for completing its first aid course towards the end of the 19th century, and by the end of the century it had awarded hundreds of thousands of St John first aid certificates in four continents (Pearn, 1994, p. 1718). Employers have also long offered certificates and badges for completing enterprise training. If the most important need were to signal competence in job skills one would expect employers to expand their provision and recognition of their certificates and badges. However, *An intriguing feature of credentials as labour market [signals] . . . is that their value is determined not just by the utility of the human capital they represent, but by the institutions that endorse them* (Milan, 2021, p. 40). And

universities are being expected to increasingly offer courses to improve their graduates' employability.

This exacerbates a trend over the last two decades of shifting responsibility for preparation for work from employers to publicly supported educational institutions, reflecting employers' disinvestment in their workers' induction and training of around 40% over this period in Canada (Hall & Cotsman, 2015, p. 6), the UK (Green et al., 2016), and the USA (Cleary & Van Noy, 2014, p. 1). Non-formal work-related learning in Australia fell by 12.4 percentage points from 2005 to 2016/17 (Australian Bureau of Statistics, 2017). Training intensity also declined, from a median of 28 hours in 2007 to 24 hours in 2017 (OECD 2019a, p. 19). Livingstone (2019) found similar declines in non-formal work-related learning in his study of Canada.

If educational institutions should develop job skills, the quickest and most flexible response would be to expand existing continuing professional education programs. Instead, micro-credentials are proposed as sharply different from institutions' current practices. The first difference is adopting the language of accreditation expressed through the word 'credential', and the second is to reorient core curriculum from scholarly knowledge to employment skills. These raise two problems: the incompatibility of micro-credentials and current systems and structures for accrediting, assuring the quality and recording substantial credentials; and the incommensurability of work skills and disciplinary knowledge.

Accrediting micro-credentials

There are increasing policy attempts to mainstream and incorporate micro-credentials into formally recognised qualifications frameworks or accreditation, validation and recognition systems. Governments want to recognise, credential and count all forms of learning including informal and non-formal learning, particularly if it will support labour market access and movement. From a policy perspective, enabling the credentialing of all learning helps to ensure an efficient system so that individuals can credential the learning they have done wherever and however they undertook it and have it 'count', and so governments don't have to pay for learning that has already been undertaken.

The credentialing of micro-credentials is one way for universities to signal the standing of their credentials to employers and potential students and to award credit for previous studies. Making learning count also putatively supports social inclusion because those who are from disadvantaged backgrounds are able to have their learning recognised. And, this process contributes to the stock of human capital in a nation because it supports 'upskilling', and the integration of learning with work.

These are the basic elements of a lifelong learning framework, and micro-credentials are now situated within that framework. It is, for example, the point of the EU's common micro-credential framework (European MOOC Consortium, 2019) and is consistent with government aspirations for post-secondary education systems that support lifelong learning, recognition and portability (OECD, 2019b).

However, while governments seek to improve the flexibility of universities and their responsiveness to employers' needs through 'quick to market' qualifications, incorporating micro-credentials into jurisdictions' qualifications frameworks risks their becoming bogged down in frameworks' quality assurance, accreditation and validation requirements.

Alternatively, governments want universities to incorporate micro-credentials into universities' quality assurance processes. However, if micro-credentials are to be included as *credentialed* certifications that count towards degrees and post graduate programs, using universities' internal quality assurance processes may also take more time than envisaged, with the usual complaints

about universities being slow to respond. Universities may also have a more restricted view of what counts as valuable educational knowledge than the proponents of the certification of job skills.

Universities' accreditation

Education uses distinctly educational structures, processes and criteria to accredit learning. These originate with the *licentia ubique docendi* (license to teach without further examination everywhere, or more specifically, in all universities) granted by papal bull from the end of the 13th century (Haskins, 1941, p. 282; Moodie, 2007). Accreditation processes have been successively adopted by universities themselves, such as the University of Durham upon its foundation in 1832 (Silver, 1996, p. 189), associations of USA universities in regional accrediting bodies from 1885 (Brittingham, 2009, p. 8), and by the Association of American Universities from its foundation in 1900 (Speicher, 2000).

Accreditation structures, processes and criteria are integrated with related activities. They have been systematised and often mandated by governments as quality assurance processes. And they have been incorporated within occupational accreditation and licensing requirements mandated by occupational bodies and often by governments.

The purposes of accreditation and its related processes of quality assurance and occupational licensing are to maintain standards, maintain and often improve quality, establish similarity of provision, and establish relative levels of provision such as those systematised by qualifications frameworks. These are essentially conservative purposes designed to minimise the risk of a failure of standards or quality. Ensuring similarity of quality and standards with other programs both within the institution and outside entails extensive comparison and often consultation with others, which is often time consuming. It involves integrating each educational credential within a network of all other educational credentials and their processes for quality assurance.

Universities Australia. (2021, p. 6) recommends three minimum standards necessary *to enable the rapid recognition of microcredentials by Australian universities*:

1. Microcredentials have clear evidence of achievement or learning outcome;
2. Microcredentials have an understandable unit of exchange; and
3. Microcredentials are quality assured and verifiable, with sufficient, relevant metadata.

Universities Australia. (2021, p. 8) states that credit can be recognised only where there is information on the volume and depth of learning. This information is not available where the only information provided is on competences or other outcomes, as many advocate for micro-credentials. However, specification of the volume of learning is a fraught debate in Australia, particularly in the vocational education sector where 'purist' champions of competency-based training (which is the mandated model of curriculum in that sector) claim that certification should be awarded based on demonstration of competence, and that volume of learning or the time taken to learn particular competencies is irrelevant. Contra this position, others within vocational education have (successfully) argued that volume of learning is an important indication of the depth and complexity of expected learning, and needed to overcome low-quality, unreliable, and frankly, oftentimes dodgy, training (Wheelahan, 2016). The Australian Government's (2022) national micro-credentials framework seems to be oblivious to this debate and doesn't recognise any incompatibility the concept of competence and specifying a volume of learning. Specifying credentials by learning outcomes avoids this but raises other problems (Boud & Jorre de St Jorre, 2021).

Furthermore, to use a very good phrase from the United States, the framework seems to 'nickel and dime' (or overly and minutely specify) the inputs required before micro-credentials can be accredited in requiring requires records of micro-credentials to include estimates of:

a. Number of hours of in-person face-to-face contact with teaching staff.
b. Number of hours of synchronous online contact with teaching staff.
c. Number of hours of peer-to-peer engagement and its mode.
d. Estimated number of hours of asynchronous online content and reading/viewing of audiovisual material, etc.
e. Estimated number of hours spent on assessment. (Australian Government, 2022, pp. 13, 17)

Since micro-credentials may be from one hour to six months in duration, these estimates may be of very brief amounts of time indeed. It is hard to understand how this nickel-and-diming was agreed by the vocational and higher education educators who were eight of the 16 members of the micro-credentials working group convened by the Department to *discuss and agree key elements of the framework* by *broad consensus (*Australian Government, 2022, p. 20). Neither universities nor colleges provide this information about their substantial credentials, and they probably couldn't without substantial additional work. This nickel-and-diming of teaching and learning is incompatible with the development of students' capacity to manage their own learning that is one of the goals of post-secondary education.

Records

Current processes for verifying credentials are manageable for the two or three degrees that may be claimed by a person. One degree from one institution might correspond to the volume of six or more micro-credentials awarded by multiple bodies from different sectors, and verifying those is very cumbersome by current processes. The various computer applications and platforms that have been established to record, authenticate, store and transmit multiple qualifications need to integrate records in ways that makes sense for jurisdictions' different approaches, and this is not particularly straight forward given that these apps and platforms were not designed with jurisdictions' requirements in mind (Chakroun & Keevy, 2018, p. 33).

Chakroun and Keevy (2018) explain that the world reference levels system should *include functions to continuously capture, connect, archive and share global metadata about credentials, credentialing organizations, quality assurance organizations and competency frameworks, and additional metadata as needed to support the cross-border recognition of qualifications* (p.34).

Doing this on a national level would arguably have significant challenges, and these problems are magnified at the international level. How are employers or other educational jurisdictions to distinguish between providers that are low quality and those that are high quality even if they use the same platform to record and transmit results and other outcomes? These issues become particularly acute in for-profit markets where the strong incentive is to drive costs down.

Recognition of expertise in employment

Educational accreditation contrasts sharply to the recognition of expertise in employment which is embedded within employment rather than educational processes. Expert practitioners have distinctive ways of reflection (Schön, 1983) which require distinctive forms of development (Schön, 1987). Expertise in practice is recognised in stages such as novice, advanced beginner, competent, proficient, and expert (Dreyfus & Dreyfus, 1986, p. 21), and participation in expert practice is understood in several levels such as transactional, peripheral, occasional, active, and core group (Lave & Wenger, 1991; Wenger & Trayner, 2011).

Different levels of practice are recognised differently in different fields, such as nursing's five levels of proficiency (Benner, 1982, p. 402) and medicine's five levels of entrustable professional activity

(ten Cate, 2018). The core criterion for the recognition of expertise in employment is the practitioner's integration within a specific field of practice if not a site of employment. Comparability and still less similarity of practice with other fields and sites is less relevant to the recognition of expertise in employment, yet comparability and similarity with other fields is central to the recognition of educational expertise.

Irreconcilable differences

Micro-credentials are often designed to develop employability skills. Advocates distinguish carefully between employability, being employable and employment (Artess, Hooley, & Mellors-Bourne, 2017):

> *Some writers seek to use employment outcomes as a measure of graduates' employability. However, others make a distinction between employment, being employable (which is specific to a job role), and employability, which can be used to describe a general set of students attributes and qualities which are not directly related to their current employment status. This distinction is important because both employment and being employable are strongly related to labour market conditions and to the perceptions of employers while it is possible to define employability in broader and less contingent ways* (p. 15).

This understands employability as:

> *…a set of achievements – skills, understandings and personal attributes – that makes graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy* (Yorke, 2006, p. 8).

While employability 'skills' and 'knowledge' may not necessarily be construed narrowly (Yorke, 2006, p. 8), they are clearly contrasted with educational knowledge and skills. The criterion for success in developing employability is increasing the probability of gaining employment (Yorke, 2006, p. 8), which contrasts with developing educational knowledge and skills. Furthermore, employability implies a quick responsiveness to employers' disparate and changeable needs, while educational knowledge and skills are institutionalised stably similarly in different institutions and cultures (Meye et al., 2007).

There seems no way of reconciling these differences, given that education and work are inherently distinctly different domains (Buchanan et al., 2020, pp. 9, 16). Indeed, some advocates of micro-credentials make a virtue of their incompatibility with educational institutions, seeking to disrupt them.

Even if these difficulties could be resolved, they would not address either of the two main problems micro-credentials are often proposed to fix: higher education's inequity, and the plateauing of the economic benefits of higher education.

Higher education's many failings: Inequity

From their foundation from the 12th century until around the late 16th century most European universities probably enrolled mostly students from the more prosperous peasant and yeoman classes with perhaps around 15% of ambitious, able, and fortunate students from more modest backgrounds (Moodie, 2016). However, European universities' social composition changed from the late Middle Ages. The proportion of Oxford matriculants who were gentlemen or above increased from 39% in 1575-1579 to 52% in 1600-1609 (O'Day, 1982, p. 90).

For their second 400 years European universities, and from their foundation universities in the USA, Canada and elsewhere, have been dominated by students from upper and upper middle class backgrounds. As higher education participation has transitioned from elite to mass and now to

universal (Trow, 1973), inequity in participation moved from all higher education to the more elite institutions and programs in a process Lucas (2001) identified as effectively maintained inequality. Even so, people from lower and lower middle class backgrounds remain heavily under represented in higher education.

Higher education's inequity is a problem because higher education is an intrinsic good, because it improves graduates' lives, and because it extends their capability (Sen, 1999; Nussbaum, 2000; Moodie & Wheelahan, in press). But it also has important secondary effects since higher education influences access to good jobs, even when higher education is not directly necessary or even relevant to the job (Arrow, 1973, p. 194). Education, which reflects a particular kind of attainment, has come to signify merit generally (Young, 2001). It is permissible and acceptable to discriminate against people on the grounds of education when it is impermissible or unacceptable to discriminate against them on the grounds of class or some other characteristic strongly associated with higher education. While these secondary effects reflect higher education's inequity, not all are attributable to higher education so much as to employers and society generally which apply higher education credentials beyond their domain.

Higher education's inequity starts at birth. Indicators of socially produced disadvantage are pervasive and implicated in all social institutions and in the distribution of opportunities. All parents want the best for their children, but not all are equally resourced in providing opportunities or in accessing the institutions that can provide them (McLoyd, 1990; Linver, Brooks-Gunn, & Kohen, 1999; Behrman & Rosenzweig, 2004; Black, Devereux, & Salvanes, 2005).

These disadvantages in childhood lead to lower attainment in the early years of schooling. While almost all primary school pupils aspire to enter university, children quickly understand what is feasible for them from their marks, finances, and social circumstances, and they adjust their aspirations accordingly (James, 2002; Bowden & Doughney, 2010; Dupriez, Monseur, & Lafontaine, 2012; Harrison & Waller, 2018; Bennett & Lumb, 2019, p. 968). This results in some students being contingent and others embedded choosers of higher education (Ball, Reay, & David, 2002, p. 336).

Educational disadvantage accumulates throughout schooling and results eventually in leaving school early or to lower attainment in the final years of schooling. This greatly reduces students' options for higher education. Even when non-traditional students enrol in higher education their choices are more heavily constrained than their middle class fellow students (Reay et al., 2001).

This cumulative filtering and shaping of peoples' educational attainment operates at the level of individual, family, and class (Boudon, 1974; Bourdieu, 1979/1984). It reflects economic and social structures of society as a whole, and the mobilisation and exercise of political power (Piketty, 2020). And of course it does not start at birth, but is transmitted through generations (Bourdieu, 1973; Bourdieu & Passeron, 1990).

Micro-credentials address none of these challenges. At best they add another supplementary option for those whose choices are constrained, but it is to an option of degraded educational value (Wheelahan & Moodie, 2021a).

Higher education's many failings: Un(der)employment

Post-secondary education has been dominated for the last half century by human capital theory and more recently by skill-biased technological change (Lauder, Brown, & Cheung, 2018) which argues that education has economic value only when it develops the right kinds of skills, those driven by technological change. This readily degrades into a skills fetish (Wheelahan, Moodie, & Doughney, 2022).

Human capital theory has been criticised extensively on empirical, methodological, and normative grounds (Tan, 2014, p. 411). It was initially descriptive, explaining financial rewards from expanding

education; and explaining why individuals, companies, and governments increased their spending on education. During the 1980s and 1990s human capital theory then also became normative: advocates argued that investment in human capital should be increased to increase financial rewards. Since the 2000s human capital theory has become increasingly prescriptive, with advocates arguing that post-secondary education should be increasingly concentrated on and then restricted to programs thought to have most economic benefit (Moodie & Wheelahan, in press). Consequently the plateauing of the economic benefits of higher education has been considered a failing of higher education, rather than of the labour market, and still less of human capital theory.

While the employment and income benefits of substantial credentials have plateaued recently, they remain substantial (Ma, Pender, & Welch, 2019; Hailemariam, 2018; Patrinos, 2016; Montenegro & Patrinos, 2014; Boarini & Strauss, 2007), unlike those of micro-credentials. Data on micro-credentials are scarce because most are so recent and because they are not defined consistently. A partial exception are skills sets, which have been offered in Australian vocational education and training since 2006 (Mills et al., 2012, p. 11). Skills sets are *single units or combinations of units which link to a licence or regulatory requirement, or defined industry need* (National Quality Council 2006, cited in Mills et al., 2012, p. 7). Yet completing full qualifications generally has substantially more benefits than completing just modules (Karmel & Fieger, 2012, p. 20). And *completion of a full qualification in the trades on average leads to better labour market outcomes than completion of a module or a set of modules* (Lu, 2015, p. 8). Consequently while enrolments in skill sets have grown over time, they were only 3.7% of all Australian vocational education and training program enrolments in 2018 (Stanwick & Siekmann, 2019, p. 9).

As we have elaborated elsewhere (Wheelahan & Moodie, 2021b), several studies of short credentials in the USA have found 'only weakly positive and inconsistent gains from these award combinations' (Bailey & Belfield, 2017, abstract). Completing a certificate of up to a year's duration increased graduates' chances of being employed, but not their median salary compared with non-completers (Burns & Bentz, 2020, p. 3). More than half of adults with a short-term certificate of up to 15-week duration who were employed, earned $US30,000 or less per year, which is below the national poverty line for a household of four (Ositelu, 2021, pp. 10-11). Further, *the median yearly income for Black and Latino/Latina adults with a short-term certificate is $US10, 000 to $US20,000 less than the median yearly income of their white counterparts who hold a credential of similar length*. Some 41% of graduates with a short-term certificate were unemployed and of those who were employed, 39% reported that their current job was not related to their credential (Ositelu, 2021, pp. 14-15).

Most of these studies were of the outcomes of micro-credentials offered by educational institutions. Kässi and Lehdonvirta (2022) investigated the effects of micro-credentials offered through an online freelancing labour market on employment in that labour market.

> *The [unidentified] platform in question hosts millions of freelance workers who bid for thousands of new projects that employers post on the platform each day. Most of the matches are transnational, and the work is performed remotely over the Internet. Workers can undertake voluntary computer administered skill tests on the platform, which, if successfully completed, earn them microcredentials that are displayed in their profiles. Over 300 credentials are available on skills such as programming languages, graphic design techniques, and office software packages. Our data consist of the microcredentials earned and projects completed by a representative sample of 46,791 workers on the platform over a period of 9 years* (Kässi & Lehdonvirta, 2022, pp. 3-4).

The micro-credentials were awarded for completing tests that take about 30 minutes to complete *that are highly technical, quizzing test takers about very specific facts within their skill areas* (Kässi & Lehdonvirta, 2022, pp. 8-9).

Kässi and Lehdonvirta (2022, pp. 15, 16) generated their sample of 46,791 workers randomly from all workers on the platform; their sample of workers had completed 467,455 projects. The workers worked mostly on a single category of job and mostly completed micro-credentials in the same category (Kässi & Lehdonvirta, 2022, p. 18). Kässi and Lehdonvirta, (2022, pp. 35, 7) find that micro-credentials are beneficial only in the same category as the work, and that 'micro-credentials' impacts on labor market outcomes are considerably smaller than are the impacts of past work experience, agency affiliation, and algorithmic recommendations. So even micro-credentials designed for a specific online employment platform and offered on that platform improve labour market outcomes only a little.

Micro-credentials are unlikely to strengthen the relations between education and work because they consider only one side of the relation. Much more attention is needed to the structure of work, the structure of the labour market, and the development of cognitive skills at work: *The fundamental problem is not that there is a shortage of the relevant skills that employers demand but that there is a lack of good-quality jobs. The problem that needs to be addressed is not labour scarcity but job scarcity* (Brown, P., Lauder, H., & Cheung, S. Y. (2020, p. 133).

Conclusion

Though they serve multiple educational, employment, social, and cultural purposes (Dewey, 1916/1966, pp. 258-259; Geiger, 2015, p. ix) educational credentials do so by developing and certifying educational knowledge and skills. Educational institutions establish trust and credibility in their credentials by integrating them within a network of all other educational credentials and their processes for assuring standards and quality. Educational credentials have become institutionalised in this sociological sense (Meyer, et al., 2007).

Some understand micro-credentials to be just small versions or parts of substantial credentials (Chakroun & Keevy, 2018, p. 10; European MOOC Consortium, 2019, 2nd page; Kato, Galán-Muros, & Weko, 2020, pp. 8-9). These nonetheless change the regulative discourse of higher education, and degrade relations of classification and framing of the curriculum (Wheelahan & Moodie, 2021a). Others posit micro-credentials as also developing graduates' employability. This distorts and corrodes higher education (Wheelahan & Moodie, 2021b) in pursuit of a chimera (Wheelahan, Moodie, & Doughney, 2022).

Micro-credentials that seek to develop employability seek recognition which is embedded within employment, for which the core criterion is integration within a specific field of practice, if not a site of employment. In this contribution we have argued that this is incompatible with educational accreditation which integrates credentials within a network of all other educational credentials and their processes for assuring standards and quality.

Employability is also deeply embedded within the human capital framework of the capitalist economy. We have previously argued in contrast that all post-secondary educational credentials should have three pluralist roles, though with different emphases and orientations, of providing entry to and progression in the workforce, providing access to further education, and promoting social inclusion (Moodie et al., 2013).

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