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The Multiple Affordances, Complexities and Limitations of Micro-credentials – Practitioner Voices

Dr Jeremy Hanshaw[a],
[a]American University of Phnom Penh, Kingdom of Cambodia

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Abstract

In this paper I analyse the voices of practitioners and stakeholders in the micro-credentials arena to answer the research question: What are the possible affordances, complexities and limitations of micro-credentials? There is much written on the potential of micro-credentials as an agent of change for better or worse (Desmarchelier & Cary, 2022, Gibson et al., 2016, Hanshaw, 2024, McGreal & Olcott, 2022, Pollard & Vincent, 2022, Ralston, 2021, Wilson et al., 2016). However, there is little literature on the affordances, complexities and limitations of micro-credentials experienced in practice – research documenting events and utilising the voices of practitioners. My data collection involved developing a data set of practitioner voices through semi-structured interviews. By using Qualitative Descriptive Research with Reflexive Thematic Analyses, I uncover themes indicating the affordances of micro-credentials, as well complexities and limitations. Following the voices of practitioners' lived experience points can bring us to understanding new ways of doing things (Clandinin & Connelly, 2000). By heeding the voices of practitioners, stakeholders may understand how better to leverage micro-credentialing to the betterment of the human experience.

Practitioner Notes

1. This paper explores the multiple affordances and numerous related complexities of micro-credentials through the voices of practitioners and one learner in the micro-credentialing spaces.
2. It identifies some of the concomitant key affordances of micro-credentials, which speak of their potential, as well as numerous complexities and limitations, which hinder the buildout of them.
3. The multiple affordances of micro-credentials can be seen as catalysts to change the education landscape, and the numerous complexities and limitations are related inhibitors that stymy such change.

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INTRODUCTION

In this paper, I start by defining micro-credentials and considering some of their inherent characteristics, which coalesce to form multiple affordances, which speak of the potential of micro-credentials. The practitioner stories re-told in this paper give voice to multiple powerful affordances of micro-credentials, which I identify as possible catalysts to change within global education. The practitioner voices also assist me in identifying four key complexities or limitations of micro-credentials, which can be seen as possible inhibitors to change, which I explore through the lenses of Power/Knowledge and Disruptive Innovations. Finally, I consider the relationship between these catalysts and inhibitors and make recommendations as to how we might harness micro-credentials in the future.

When I started this study in 2018, micro-credentials were a 'hot' topic. Though there was no agreement in the literature as to what they were or how to define them; as practitioners we were bound by our terms (Oliver & UNESCO, 2022). During the global pandemic, micro-credentials appeared to disappear from the academic radar. However, post-COVID-19, micro-credentials have re-emerged as a topic of academic debate (see Ahsan, et al, 2023, Ashizawa et al., 2024, Hanshaw, 2024, Orman et al., 2023, Tamoliune et al., 2023, Varadarajan et al., 2023, Weller, 2023). One factor could be the rise in interest in the virtual university post-COVID-19 (Fitzgerald, et al., 2023).

The European Commission (2020) defines a 'micro-credential' as a small, specific piece of learning and assessment, awarded by a trusted body, with agreed learning outcomes and standards of achievement, is quality assured, articulates credit volume, and is aligned with a national qualification framework and the European Qualification Framework. Oliver and UNESCO (2022) argue micro-credentials should be human-centric and effective in promoting equity (United National Sustainable Development Goal Four). They also leverage digital transformation to bridge the digital divide, warning they should *not* be over-regulated.

The New Zealand Qualifications Authority (NZQA, 2020, Online**)** offers a definition of micro-credentials as "a sub-set of training schemes that certify achievement of a coherent set of skills and knowledge and that have evidence of need by industry, employers, iwi [community of people] and/or the community."

LITERATURE REVIEW

Affordances

Gibson (1979) is largely attributed with creating the term 'affordances'. He defines 'affordance' as that which can be provided to a party by an agent, giving the example of the environment, which provides the animal with good or ill; the agent and party are complementary, as the animal complements the environment and vice-versa (Gibson, 1979). In this context, the agent is the micro-credential and the party/ parties are the learners, the various stakeholders of micro-credentials.

Affordances of Micro-credentials

Micro-credentials can afford flexibility and 'just-in-time' training modalities to enable learners to function in new and emerging critical areas of practice (McGreal & Olcott, 2022). Therefore, they can potentially afford the development of knowledge and skills in emergent areas of theory and

practice which are required urgently. The traditional degree does not always provide this urgent acquisition in the emergent space (Hanshaw, 2024). Therefore, micro-credentials could be strategically deployed to develop competence and capability when required and where required, urgently and emergently.

Micro-credentials can be readily deployed to develop workforces in critical areas of practice (McGreal & Olcott, 2021). Micro-credentials have also been used to plug skills gaps in high stakes environs, such as providing educators with the necessary continuing professional development credentials to avoid being removed from the teaching register (Tooley & Hood, 2021). This is a good example of micro-credentials being deployed in a just-in-time mode.

Micro-credentials have been observed as a contributor to digital transformation in education (Ozbek, 2019). However, there is little evidence of them having a transformative effect upon the lives of individuals or communities, which is the subject of this article.

Micro-credentials can go some way to promoting equity and access to education on the grounds of time and financial affordability and academic and cognitive manageability, when compared with larger, macro-qualifications (Hanshaw, 2024). They provide life-long and life-wide learning alternatives to the lengthy and costly degree (Desmarchelier & Cary, 2022) and are simply more manageable for reasons of cost and time (Tehan & Cash, 2020). Affordability has become one of the drivers in the growth of micro-credentials (European Commission, 2020). Oliver and UNESCO (2022) see an even larger picture, positing that micro-credentials can promote equity by bridging the digital divide between rich and poor, though this is perhaps a more complex issue than can be solved with micro-credentials alone.

Micro-credentials can assist institutions in moving away from a seat-time model of learning to a competency-based curriculum (Wilson, et al., 2016). Integrating micro-credentials into the curriculum can provide added value to multiple learners and is readily achieved given the validation metrics of them (McGreal & Olcott, 2022). To embed them into the curriculum can assist students to uncover and understand their potential worth (Pollard & Vincent, 2022). It can enhance learner success to repackage qualifications into a series of stackable micro-credentials where one is seeing low levels of admission or high levels of learners dropping out (Hanshaw, 2023).

The Complexities and Limitations of Micro-credentials

However, there are those that argue that, rather than empowering learners, micro-credentials disempower institutions and “contribute to the privatisation of education by unbundling the curriculum and blurring the line between public and private provision in higher education” (Wheelahan & Moodie, 2022, p. 1288). However, there is nothing new in public-private partnership between universities and industry (see Lopokoiyit et al., 2023, Plewa et al., 2013).

They are posited as reductive for lower-order skills (Lewis & Lodge, 2016), accelerate the privatisation of higher education (Wheelahan & Moodie, 2022), or are even “a moral hazard” (Ralston, 2021, p. 95), pander to neo-liberalism and encourage unethical decision-making in order to satisfy targets, serving an iterative obsolescence to create false need (Ralston, 2021). Creative destruction is the "process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (Schumpeter, 1942, p.83). However, there are those that posit micro-credentials can promote equity, access, and participation in education because of their micro characteristics

(Desmarchelier & Cary, 2022, Hanshaw, 2024) or bridge the digital divide of a world where tens of millions live in digital poverty or illiteracy (Oliver & UNESCO, 2022).

METHODS

My over-arching method of data collection, analysis, and presentation is Qualitative Descriptive Research. The data was collected through semi-structured interviews of stakeholders to "mediate stories" into being (Kim, 2016, p. 151). The respondents were either practitioners or learners in micro-credentialing in Aotearoa New Zealand and Canada, interviewed between 2021 and 2024. Participants were identified as active experts in micro-credentials, in respect of practitioners, or those who were available, in respect of the learner.

Reflexive Thematic Analysis was used to code my data set and generate themes (University of Auckland, n.d.), initially candidate themes, and later confirmed themes, as to the multiple affordances, complexities and limitations of micro-credentials as I curate them from within and outside the data set. The themes were chosen by initially coding the data, which enables the researcher to fully engage with the data set (Braun & Clarke, 2022). From these I identified verisimilitudes of distinct theme possibilities which manifested into a monomial, two binomials, and one trinomial theme at my curation, based on their complementary and concomitant characteristics. The themes captured a shared meaning organised around a central concept (Braun & Clarke, 2022) as *affordances* or *complexities and limitations* in micro-credentials.

The data is presented as narratives with qualitative description of findings. The narratives give due consideration, where appropriate, to factors such as time, personal and social interaction, and place (Clandinin & Connelly, 2000). New ways of documenting experiences emerge by the merging of Case Study and Narrative Inquiry, providing structure and agency within the storied lives of practitioners (Sonday, et al., 2020). From these stories, I attempt to create "narrative meaning" (Polkinghorne, 1988), to answer the research question: What are the possible affordances, complexities and limitations of micro-credentials? There are ten practitioner voices in total in this paper. Below are the key results from this study.

RESULTS

Table of Participants

Below are the ten participants in this study, with a description of their role and significance, in chronological order:

Table 1

List of participants in this study

Participant	Role and Significance
D1	Canadian Government expert in the development and deployment of micro-credentials, stackability and transferability, and the connections between micro-credentials and competencies.

J	Former college leader in vocational education in Canada with considerable experience in micro-credential development in a community setting.
T	Heads a Non-Governmental Organisation (NGO) in New Zealand specialising in developing workplace literacy.
K	Micro-credential developer and assessor based in New Zealand.
B	Micro-credential learner in New Zealand who undertook a micro-credential in money management.
N	Head of Business and Digital Technologies at a tertiary institution in New Zealand.
M	Leads micro-credentialing development at a New Zealand tertiary institution.
P	Former tertiary leader in New Zealand and one of the key ideators of micro-credentialing in Australasia.
F	Leads the development of micro-credentials in software development, business intelligence, and data analytics, in partnership with a major on-line learning platform.
D2	Academic and Programme Leader at a New Zealand tertiary institution.

The Multiple Affordances of Micro-credentials

Micro-credentials as Urgent and Emergent

D1 works for the Canadian Government in the development of micro-credentials. In 2020 the world found itself in the grips of a global pandemic. The Canadian health system, like many others, was stretched to the point of failure. There was a lack of staff who were qualified in how to safely fit and manage a respirator for the thousands of patients who were struggling to breathe. As a result, a micro-credential in the safe use of a respirator was hurriedly developed in conjunction with the technological polytechnics in Canada and 25,000 people were trained and credentialed quickly to provide urgent support on hospital wards. The prioritising of respirators had a significant impact on controlling the effects of COVID-19 symptoms (Ngonghala, et al., 2021). This urgent upskilling in, what for many was, an emergent (and critical) area of practice, saved countless lives.

The foregoing demonstrates that micro-credentials are highly effective in developing and recognising knowledge and skills in urgent and emergent frames of practice. Ralston (2021, p. 95) terms them “dangerously reductivist”, however, in this case it was their very reductivist nature as *micro*-credentials which afforded them the power to be swiftly and judiciously deployed. The learning that made up this micro-credential in respirator use has no doubt been integrated into the regular nursing and medicine curricula. This is also an example of micro-credentials serving traditional qualifications, something we will explore further in due course.

Lewis and Lodge (2016) and Ralston (2021) posit that micro-credentials are for lower-order thinking; others that they limit higher education (Wheelahan & Moodie, 2022). D’s next project was to develop a digital heath and artificial intelligence competency framework for a group of

research universities based in Geneva. “It’s an emergent field geared up for those at doctoral level,” D said. Micro-credentials in a highly complex area of practice at doctoral level – this is evidence that micro-credentials are not simply afforded to developing lower-order thinking. Rather than generating “revenue through planned obsolescence” (Ralston 2021, p. 95), the result is the opposite: emergence, the bringing into being that which was not before.

Micro-credentials as Critical and Transformative

J was a leader in vocational education in Canada. During the COVID-19 pandemic, there was a shortage of personal support workers to go into people’s home or care homes to support the elderly and the dying. J recounts, “looking at older people in nursing homes dying, and dying alone, was unbelievably horrible.” J secured funding and a series of micro-credentials were developed to enable more people to more quickly start supporting the most vulnerable. J explained that usually the training is one year, however, as a series of micro-credentials the training could be as little as a month for those with a good skill-set and experience of working as an unqualified support worker. J recalls, “I think for all of us, including them, it made us feel so much better, that we were able to do something quickly.”

Again, this is an example of micro-credentials being urgently deployed, but this time in a critical area of practice, which most likely had a transformative effect for the most vulnerable at the time of high uncertainty caused by COVID-19. This is in contrary to Ralston’s claim that with micro-credentials, “abandoned is the higher purpose of education: namely, to serve society-at-large, not simply corporations and industry” (Ralston, 2021, p. 92). Evidently society is being served by the development of these micro-credentials. I cannot think of a better example of education being afforded a higher purpose than saving, and improving the quality of, lives.

T leads a non-government organisation (NGO) on the north island of New Zealand which specialises in workplace literacy. She developed micro-credentials with a polytechnic provider on speaking up for health and safety on the construction site and another on money management. T explains,

> The health and safety micro-credential is probably in the high stakes camp. But it is also transformative. The other micro-credential [money management], it's transformative. We're opening up learning opportunities for people who otherwise would not be given [them].

K is an assessor for the money management micro-credential in New Zealand. She recalls the learners were “deeply hardworking, but also deeply unaware of how to manage their money.” She said it was evident that once you taught somebody how to budget, “you empower them to make different decisions.”

Now to turn to the story of a learner. B was born and raised in western Auckland, is a mother of one, and undertook the money management micro-credential. She said the budgeting tool she learned, she prints it, laminates it and keeps it on display in her room.

> My saving, my discipline, in terms of saving has just skyrocketed. I mean, if I was doing this interview two or three years ago, no way I'd have any money, I wouldn't, I would have no money saved.

B said that though she would not describe the micro-credential as transformative, it did make a difference to her life. This resonates with T’s suggestion that micro-credentials need to make a

difference to be successful. Oliver and UNESCO (2022) argue that micro-credentials need to be useful, however, this concept of making a difference, goes one step further by improving the quality of the human experience. Though it could be argued that any training or credential can make a difference to a person's life, it is perhaps the unique affordances of being urgently deployed in emergent or/ and critical areas and potentially transformative spaces, where the true power of micro-credentials may lie.

Micro-credentials as Promoting Equity, Access, and Participation

To return to J's story, her team developed a series of micro-credentials available to her community in Ontario free of charge during the COVID-19 pandemic. There were micro-credentials on how to bake a cake, how to keep fit at home, DIY around the home, how to cook a pasta dish, indeed many areas of practice that were likely hugely beneficial and of ready interest during lockdown. J recalls:

> It was very successful. I think we had 17,000 registrations – for a small town was huge. Now they want to take a diploma programme or a certificate, or whatever. So, it was a good way, I think, to open that door.

What differentiates this initiative from 'the university of YouTube' is the assessment element: learners had to engage with the assessment process to obtain the credential. It started to build the community's relationship with micro-credentials, which, J reports, continues today.

Micro-credentials are more manageable because of reasons of reduced cost and time in the undertaking of them (Tehan & Cash, 2020). J said that the lower cost of a micro-credential over a larger qualification and the shorter period to complete it, was likely an important factor in the subsequent success of micro-credentials in her community according to many learners. Micro-credentials in this case provide a clear and effective pathway to macro qualifications.

In addition to time and cost, the manageability of a *micro*-credential is another empowering characteristic. P comments:

> The fear of no success keeps a lot of people out. Failure to get success drives them out. To put together packages of learning that are smaller in scope, not necessarily in time, enable people to experience success.

To re-package qualifications from larger modules into a series of stackable micro-credentials should serve learners living disruptive lives. P argues, "I can look in the mirror and see success. And then I do the next bit. And I can see more success." Again, it is the *micro* characteristic of the micro-credential which enables it to be used powerfully to promote access to and participation in learning and credentialing. T recalls that for many of her learners on the speak up for health and safety micro-credential, it was their first qualification, of which they were, rightly, enormously proud.

Micro-credentials as Serving Traditional Qualifications

N is head of business and digital technologies at a post-secondary institution in Canterbury, New Zealand. He was looking for alternative means of study for people "who don't want to sign away three years of their lives" and wish to mix learning and studying, what he terms "a portfolio approach". He developed a series of stackable micro-credentials that learners could undertake in combination with, or between, periods of work. This also enabled learners to discover, in a low-

risk environment, whether computing, for example, was really a career they wanted to pursue: “we'll get people to sign up to a three-year degree and inside of six weeks realise what a terrible mistake they may have made.” Desmarchelier and Cary (2022, p. 6) observe that micro-credentials can assist students by “dipping their toes in the water.” Micro-credentials are therefore a pathway out of learning as well as a pathway into learning, in the best sense. However, there were also students, N said, who went on to do graduate diplomas and beyond, upon seeing success in the mirror. Micro-credentials were a pathway to success. Rather than contributing to the decline of the degree (Kazen and Klerkin, 2018), micro-credentials in this story augment it and serve as a pathway to it.

Concomitant Powerful Affordances of Micro-Credentials

What is interesting is the concomitant nature of these multiple affordances of micro-credentials. A micro-credential that responds urgently to an emergent field of practice in a pandemic is also in the critical space and has a transformative effect upon those whose lives they touch. The micro-credential that gave construction workers a voice to speak up for health and safety on the work site (critical and transformative) also bestowed them with their first academic award (promoting access and participation in education) and encouraged some to go on to study further (serving the traditional qualification). For the 17,000 learners that completed a free micro-credential in Ontario, Canada (promoting equity, access, and participation) many of them likely discovered that it made a difference to their lives in a positive way at a time of great fear and uncertainty; some of whom went on to further study and larger qualifications (promoting participation, serving traditional qualifications).

If a micro-credential is not useful, it will likely have little if any uptake (see Hanshaw, 2023). However, when it possesses any of the foregoing affordances, it contains an inherent power to have a positive effect upon the human experience and to make a difference. The greater number of these affordances a micro-credential possesses, the more power it has to make a difference to the lives of others. The following diagram summarises the multiple affordances of powerful micro-credentials, revolving around the central sphere of micro-credentials as being able to *Make a Difference:*

Figure 1: The concomitant multiple affordances of powerful micro-credentials

To return to where we began, micro-credentials are small, specific pieces of learning and assessment, awarded by a trusted body (European Commission, 2020). They are therefore micro (small and specific) and credentialed (assessed and trusted). It is these characteristics that give micro-credentials the power to swiftly make a difference with a trusted credential in one or more of those afforded ways manifested within and conveyed by these stories.

However, as with any qualification, micro-credentials have multiple complexities and limitations. These will be examined next.

The Multiple Complexities and Limitations of Micro-credentials

Over-regulation and over-burdensome Quality Assurance

Micro-credentials can be or are often over-regulated (Oliver & UNESCO, 2021). Based on the interviews, there are seemingly two different attitudes to the approval of micro-credentials in New Zealand and Ontario, Canada. In New Zealand, the NZQA plays, and often overplays, the role of 'gatekeeper' whereas in Ontario a much lighter approach is taken to approving them, with ensuing benefits in the more rapid development of micro-credentials. Over-regulation is not the fault of micro-credentials, more an over-complexity and a reflection of the environment that they exist within, however, there is no doubt that over-regulation of them hinders their development and usefulness and is a burdensome complexity.

M works in micro-credential development for one of New Zealand's leading polytechnics. She said that over-burdensome regulatory demands are "massively holding it [micro-credentials] back. Because it's a huge amount of bureaucracy." She says that the level of detail required by the New

Zealand Qualifications Authority (NZQA, 2024) for approving a micro-credential is almost as much as that required of a degree. The same is true of the learning that goes into a micro-credential, what was termed *training scheme,* which, unlike other portions of learning within the New Zealand education framework, is also regulated by the NZQA. She says that you have to repeat the entire approval process when you are micro-credentialing within existing degrees and that this hinders the 'just-in-time' characteristics of a micro-credential, that may be required urgently, as by the time it has completed the labyrinthine approval processes, it is too late to exercise the power that it could have had, if developed in a timely manner.

One of the senior officers at NZQA told me that there have been policy discussions "around how do we stop a proliferation of them?" It is therefore not by accident, but design, that these blockages exist.

Internal quality assurance was another blockage of micro-credential development at the polytechnic, which one leader termed "exquisitely complex," such was the labyrinthine nature of their complexity. K, who headed up a business unit, said they were trained as 'gatekeepers' not 'gate openers.'

In contrast, J, a vocational college leader in Ontario, Canada, said that a lighter touch to approval and quality assurance was developed for micro-credentials, "They had to be rapid. They had to be flexible. We had to move them forward quickly." Micro-credentials did not undergo the same quality assurance processes as degrees, but they are quality assured. "They are acutely aware that if they put in too many requirements, and too much oversight, as they do with the degrees, it will slow things down". It would appear, however, that slowing things down was perhaps what the NZQA had in mind.

Micro-credentials as trivial and not useful

P, who used to lead a New Zealand polytechnic, said that they initially developed a suite of micro-credentials with no learning attached. It was a credential only where the learner uploaded evidence to a portal to demonstrate they met the achieved competencies of a particular micro-credential, The NZQA refused to recognise them and still insist to this day that micro-credentials must have learning attached (NZQA, 2024). There was no uptake on these. The micro-credentials that did have uptake, were those that had learning and by and large were deemed useful (Hanshaw, 2023). The table below records a number of micro-credentials that were developed by a New Zealand polytechnic and considers them in relation to agreed measures of micro-credentials, sourced from the literature and my own research:

Table 2

Micro-credentials considered against agreed measures (Hanshaw, 2023, p. 53)

	Planning and Delivering an effective Presentation	Electric Vehicle Maintenance	Caring for those with Dementia	Wound Debridement	Speaking up in the Workplace: Construction Site Health and Safety
Training Schemes/ Learning attached	✖	✓	✓	✓	✓
Trusted body	✓	✓	✓	✓	✓
Evidence of need	✖	✓	✓	✓	✓
Agreed Quality Assurance Principles	✓	✓	✓	✓	✓
Building and recognising emergent knowledge or skills	✖	✓	✖	✖	✖
Just-in-time training/recognition	✖	✓	✖	✖	✖
Upskilling	✖	✓	✓	✓	✓
Commissioned by client	✖	✖	✓	✓	✓
Useful	✖	✓	✓	✓	✓
Gained traction (some learner completion)	✖	✖	✓	✓	✓

Employer engagement is evidently an important characteristic of a successful micro-credential in this case. After all, some proof of demand is a natural requirement within vocational education.

Much thought should be put into the development of micro-credentials to ensure they have currency and agency. Ultimately, they have to be useful (Oliver & UNESCO, 2021). They therefore need to have a purpose and one that is useful to others, otherwise there will be no uptake.

Barriers to learning

F is based in New Zealand and leads the development of micro-credentials in software development, business intelligence, and data analytics, which are placed on a major on-line learning platform. They are attractive to the self-employed and those with their own businesses.

He explains that the current funding model in New Zealand is that though learners can obtain 60% funding for a programme of study, they can only obtain a loan for the remaining 40% of the fees if the learner is undertaking 60 credits of study or more. This excludes most micro-credential learners from accessing the loan, given that by definition micro-credentials are likely less than 60 credits. This creates a barrier to learning which affects the poorest in society who cannot afford to undertake a micro-credential without a loan; in other words, it excludes those who might most benefit from them to upskill or re-skill, even if the micro-credentials are still an option for business owners and those with more money. As a result of this, the provider is now abandoning micro-credentials in favour of 60 credit modules that can enable learners to access student loans. However, a 60-credit module is a substantial undertaking and may be daunting to those with disruptive lives, which may create yet another barrier to learning.

A further barrier to learning is the possible discombobulation caused by the proliferation of micro-credentials in recent years and the ensuing issue of trust as to the accuracy and quality of the credentials (Oliver, 2019), because if a learner or employer does not trust a credential, it is a barrier to its affordance of learning, as the learner will not undertake it and the employer will not accept it.

Trust Issues and Acceptance

For micro-credentials to become part of mainstream education, they need to be trusted and accepted. Universities and other institutions are currently using and developing blockchain technologies to increase trust in their credentials (Kiiskilä et al., 2023). It is important given the proliferation of them to ensure there are trusted means by which their quality and accuracy can be measured. However, even when developed and delivered by a trusted institution, there are those that continue to take aim at them. Ralston (2021) has referred to micro-credentials as a "moral hazard…[that] contributes to the decline of the traditional degree. It paves the way for the total substitution of degree programs with micro-credentials" (p. 95.). This has not happened, however; at least not as yet.

D2 is an academic with a New Zealand tertiary institution. He says that micro-credentials are an over-reaction by universities to the criticism that they are detached from reality. He regards them as "a reductionary approach" and "backward thinking." He also believes that there is a lack of discourse around the "knowledge is power" agenda and that micro-credentials are "taking it too far to the other end." Therefore, power is being taken out of the hands of the andragogues and placed into those of learners, by enabling learners to develop their own learning journey, stack multiple micro-credentials together, and trigger macro-awards.

Former New Zealand polytechnic leader P argues that many of the critical arguments around micro-credentials as reductivist assumed that there would be no development of a methodology for guiding a stackable design:

> I'm arguing that you need a specific design methodology for stackability. And so that's one that requires each part to be self-contained, but to be mapped to a specific element of the whole of the final outcome.

P argues that this idea that a stackable series of micro-credentials is inferior is a false premise: it misrepresents what good design would do. Rigour and cohesiveness are key affordances of unbundling the curriculum (Desmarchelier & Carey, 2022), even if pegging micro-credentials to

existing frameworks can be cumbersome (Lockley, et al., 2016). He argues that the irony is that the critics of micro-credentials are likely working on ten or 15 credit blocks of learning without any design methodology, and a 40 credit micro-credential at post-graduate is a substantial piece of learning. “It allows for all of the things to occur that the critics argue won't”, he says, in contrast with Ralston’s (2021) claims that micro-credentials are over-simplistic and even immoral, or as Lewis & Lodge (2016) posit, best applied to low order skills. What P suggests is a means of glueing together multiple micro-credentials from numerous sources, employing a capstone assessment or a reflective exercise to act as the glue, as a means of ensuring they stick together. K, an assessor at a New Zealand polytechnic, said, “Now that really is disruptive.”

Power/Knowledge and Disruptive Innovations

Power is practised in society as a strategy to exert control over others and manifests itself in institutions; it also manifests itself in the power relations between individuals and their inter-play with institutions and each other; ultimately power produces knowledge, which in turn produces power (Foucault, 1980). Universities are generally regarded as accepted forms of knowledge. As are schools and other institutions, often contained within a hierarchy of *invited spaces* (Powercube.net, Online). Military and police organisations are generally regarded as accepted forms of power, although Foucault (1980) argues that violence is not necessary for power structures to disseminate and operate. Within certain jurisdictions practice may be regarded as evidence of custom (Higgins, 1995). It is customary for learners to be instructed, in what they learn, how they learn it, when, with whom, and by whom. There are power structures within and between educational systems as well as within and between societies. The relationship between education, governance and society is a complex one (Fazekas & Burns, 2012). One inescapable feature of power is bureaucracy, which “is powerful because it provides certain values including hierarchy, impersonality, and expertise” (Mai, 2016, p. 247). It would also seem logical that a bureaucratic institution such as a regulator would have the most knowledge regarding the rules, how and when they might enact them, or impose penalties for non-compliance, which is where their power lies, as well as in developing new rules and new knowledge to power over others.

Ball (2013) argues that what is being created is a new ontology of learning, “the technology of the self”, which shape us to the needs of learning. Keep (1997) posits that every organisation wishes to become a learning organisation, no doubt with the power to decide what is learned, by whom, where, when and how. “A personal learning plan, written down and monitored with a chosen mentor” (Keep, 1997, 457). At the centre of the process of power is “how human beings are made into social subjects” (Foucault, 1980, p. 208). Educational institutions play a key role at turning us into social subjects and those that fund, regulate, and run them traditionally decide the modus by which this is done. To put power into the hands of learners is to take power away from the holders of the keys, turning institutions, privileged *invited spaces* (Powercube.net, Online) into *claimed spaces* (Powercube.net, Online).

M, who leads the development of micro-credentials in a New Zealand polytechnic, argues,

> It puts the learning pathway in the hands of the learner. They have much more control over what they choosing to learn, as opposed to the institution. That's extremely disruptive.

Disruptive innovations create footholds in markets where no market existed, turning the non-consumer into the consumer (Christensen et al., 2015). Micro-credentials, by the affordance of

promoting equity access and participation, make learners of non-learners or never-would-have-been learners. The success of disruptive innovations for mainstream consumers is quality dependant: they do not become popular until they possess sufficient quality (Christensen et al., 2015). We noted the perceived quality concerns above, as well as philosophical aversion from those within the existing power structures. Micro-credentials represent a disruptive innovation in that they give the power of the learning eco-system – who learners what, where, when, how, by whom, and in which order – to the learner, not traditional power/knowledge structures. These power structures are possibly acting to hinder their integration into the mainstream, and the reputational slurs they receive, themselves a threat to the success of micro-credentials, are perhaps a witting or unwitting result of that perceived threat of such a disruptive innovation.

Concomitant Complexities and Limitations of Micro-credentials

Much like the multiple affordances in Figure 6, these complexities and limitations are concomitant. Over-regulation and Quality Assurance is a barrier to learning, by slowing innovation and development, limiting access, and denying access to funding. The lack of trust and acceptance of micro-credentials in some quarters and the lack of an integrated design methodology also creates a barrier to learning by discouraging learner and employer recognition. Micro-credentials that are trivial or lack usefulness are evidently a waste of everyone's time, except for this learning. Below is a diagram depicting four complexities and limitations of micro-credentials revolving around the central sphere of Power/Knowledge and fear of disruptive innovations.

Figure 2: Four concomitant complexities and limitations of micro-credentials

Just as the more powerful affordances a micro-credential has, the more powerful it is, the more complexities and limitations a micro-credential is affected by, the more it is impeded or obstructed. This can be further evidenced by two contrasting voices.

The first is a practitioner in Canada who oversaw the development and roll-out of a micro-credential in a matter of weeks that was urgent and emergent, critical and transformative, promoted equity, access and participation, and serviced the traditional qualification: a micro-credential in how to administer the COVID-19 vaccine. Another was a practitioner in Australasia who oversaw the development of a micro-credential in Planning and Delivering an Effective Presentation with no learning attached. It was neither urgent nor emergent, critical or transformative, it did not promote equity, access of participation, nor serve traditional qualifications. It was subject to initial over-regulation and eventual over-burdensome quality assurance requirements, it was trivial and made no difference to most people's lives (if you give presentations as part of your professional practice, the evidence of their quality is in your delivery), it was subject to barriers to learning with a lack of funding for learners, and developed within a system with no integrated design methodology; indeed at the time the regulator did not accept that micro-credentials could or should be stacked, and they were too new to be accepted into the mainstream. It is not surprising that there was no uptake.

DISCUSSION

There are a variety of multiple affordances, complexities and limitations identified in the micro-credentialing landscape.

The six-stage process of reflexive thematic analysis (RTA) (Braun & Clake, 2022), though systematic, was not a linear process. My affordances, complexities and limitations themes generation followed rigorous analysis of the data as well as review and refinement of the themes. At first, I generated candidate themes from the coding process, before developing confirmed themes. This reflexive process is articulated in the following coding framework:

Table 3

Affordances, micro-credentials as:	**Candidate theme**	**Confirmed theme**
	Timely	Urgent and emergent
	New knowledge or skills	
	Important to/for	Critical and transformative
	Improve lives	
	Support priority learners	Promoting equity, access, and participation
	Curriculum development	Serving traditional qualifications

	Qualification reviews	
	Integration into curriculum	
Complexities and limitations of micro-credentials	**Candidate theme**	**Confirmed theme**
	Over-regulation	Over-regulation and over-burdensome Quality Assurance
	Over-zealous Quality Assurance	
	Micro-credentials that had little or no uptake	Micro-credentials as trivial and not useful
	Funding issues	Barriers to learning
	Reputation issues	
	Stacking issues	
	Micro-credentials seen as reductionist and inferior	Trust issues and acceptance
	Confusion over plethora of micro-credentials	

Eventually my themes developed further into larger, greater, deeper themes, in which the verisimilitude of a new possibility was created.

The multiple affordances of micro-credentials act like catalysts to change – micro-credentials do not necessarily change themselves, that is they do not change education as a product, however, like all catalysts, they may change the environment around them, in the positive impact they can have upon the human experience; just as the environment can have a positive impact upon animals, and animals upon the environment (Gibson, 1979). In equal measure, the numerous complexities and limitations of micro-credentials act as inhibitors to change, slowing and discombobulating their agency; just as the environment can cause animals harm and animals can prove injurious to their environs (Gibson, 1979).

There is a distinct relationship between the multiple affordances and the numerous complexities and limitations of micro-credentials. Each catalyst has an associated inhibitor. For example, the affordance of micro-credentials as urgent or emergent is hindered by the slowing effects of over-regulation and over-burdensome quality assurance, which the New Zealand voices gave narrative to. The affordance of micro-credentials as critical and transformative is impeded when the micro-credentials are trivial and make no difference to anyone's lives. The affordance of micro-credentials as promoting equity, access, and participation is hampered by the numerous barriers to learning, such as a lack of funding, regulatory issues that prevent them serving the learner

journey, and confusion at the proliferation of them by learners. Micro-credentials as serving traditional qualifications are impacted by the latter, as well as by trust issues and at times a lack of acceptance. Also, for as long as there is no integrated design methodology around stacking micro-credentials, we play into the hands of those that do not accept micro-credentials as serving the degree or other traditional qualifications.

The bigger picture is that micro-credentials that can *make a difference* to the human experience are inhibited and frustrated by the orders of power, *power/knowledge* and the *fear of disruptive innovations*, as the diagram below depicts. The catalysts are being frequently held back by the inhibitors:

Figure 3: Power struggle between catalysts and inhibitors in micro-credential landscapes

There is a highly concomitant complexity to the opposing forces of catalyst and inhibitor in the micro-credentialing landscape, with the empowering effects of micro-credentials as creating agency, being constantly impeded by the often-hostile environment of traditional power structures living in fear of disruptive innovations.

CONCLUSIONS

In this paper I have attempted to answer the research question, 'What are the possible affordances, complexities and limitations of micro-credentials?' The multiple affordances have been identified as follows:

Table 4

The multiple affordances of micro-credentials

The multiple affordances of micro-credentials ***Themes***	***A description of them***
Micro-credentials as Urgent and Emergent	Enabling the development and recognition of knowledge, skills, and capabilities in emerging areas of practice, required with some urgency; what can sometimes be termed *just-in-time* training/ credentialing
Micro-credentials as Critical and Transformative	Enabling the development and recognition of knowledge, skills, and capabilities in critical areas of practice (high stakes) with the power to transform the quality of life (high impact)
Micro-credentials as Promoting Equity, Access, and Participation	Enabling equity, access, and participation in education where previously there was limited, insufficient, or no opportunity (promoting social justice)
Micro-credentials as Serving Traditional Qualifications	Embedding the learning from a micro-credential into the greater curriculum (e.g. respirator use integrated into medicine programmes); enabling learners to select or stack a series of micro-credentials, sometimes to trigger a macro-award; and to 'taste' a macro qualification before committing to a full programme of study

Four multiple complexities and limitations are identified as follows:

Table 5

The multiple complexities and limitations of micro-credentials

The multiple complexities and limitations of micro-credentials ***Themes***	***A description of them***
Over-Regulating and Quality Assuring	Creating overburdensome demands upon micro-credentials development that slow the buildout of micro-credentials

Micro-credentials as Trivial and Not Useful	Developing micro-credentials that are in trivial areas of knowledge or practice or do not make a difference to people's lives
Barriers to Learning	Regulatory or funding issues or rules that hinder serving the learning journey
Trust Issues and Acceptance	Issues around trusting the quality and accuracy of micro-credentials, stacking them, the lack of an integrated design methodology, around triggering macro-awards by 'glueing' micro-credentials together, and a persistent lack of acceptance of micro-credentials into mainstream education

There is a clear relationship between the affordances and the complexities and limitations of micro-credentials. The affordances act as *catalysts* to change and the complexities and limitations act like *inhibitors.* Below is a table outlining each *Catalyst* and its associated *Inhibitor:*

Table 6

The Catalysts and associated Inhibitors in micro-credentialing

Catalyst	***Inhibitor***
Micro-credentials as Urgent and Emergent	*Over-Regulating and Quality Assuring*
Micro-credentials as Critical and Transformative	*Micro-credentials as Trivial and Not Useful*
Micro-credentials as Promoting Equity, Access, and Participation	*Barriers to Learning*
Micro-credentials as Serving Traditional Qualifications	*Trust Issues and Acceptance*

The big picture is that for as long as the inhibitors slow the development of micro-credentials, pulling them back and preventing them from moving forward, and becoming part of the mainstream, micro-credentials will be hindered in their ability to make a positive contribution to the human experience.

Practitioners will arguably do well to consider these multiple affordances in the future development of micro-credentials, as well as being mindful of the numerous complexities and limitations and how they might ameliorate their inhibiting effects in their own landscape. Equally, those working in urgent or emergent spaces, in critical or transformative areas of practice, those engaged in a social justice environment, or in the re-development of curricula, would do well to consider micro-credentials as a means of creating agency in the development and recognition of knowledge and skills.

Institutions would do well to explore the development of an integrated design methodology, where each micro-credential contributes a specific element to the whole of a macro-award. The latter can be ‘glued’ together by stacking individual credentials, affording flexibility, affordability and the numerous affordances highlighted in this paper. While it could be argued that stackable micro-credentials are much like a modular degree programme, micro-credentials offer standalone characteristics and greater portability, which are not so easily carried by the composite components of the traditional degree.

The comparison between regulatory environments in New Zealand and Ontario is purposed to provide insights into how micro-credential ecosystems can develop under governance structures with differing levels of support. Both jurisdictions demonstrate relatively well-resourced and flexible education systems, with a different approach in policies aimed at integrating (or not) micro-credentials into lifelong learning, education, and workforce development frameworks. However, to enhance the study's relevance to a broader international audience, it would be beneficial for future research to explore how these findings might translate to regions with fewer institutional resources or even more rigid educational infrastructures. For example, examining other potential barriers to implementation, such as limited digital capacity, entrenched credentialing systems, or political inertia could offer a more nuanced understanding of how micro-credential models might need to be adapted for diverse contexts. This additional research would not only highlight the scalability of the policy approaches discussed, but also provide practical guidance for stakeholders in less favourable environments seeking to build or reform micro-credential frameworks.

Based on the learnings from this study, I would recommend that practitioners in less-resourced or -favourable environments consider:

1. Start small with pilot projects:

   Begin by developing and testing micro-credentials within specific fields or communities. Pilots help demonstrate value, build local expertise, and gather evidence to support broader adoption.

2. Leverage existing infrastructure and partnerships:

   Use available resources creatively: partner with industry, NGOs, or international bodies to share platforms, expertise, and funding for micro-credential development and delivery.

3. Focus on flexible, competency-based models:

   Design micro-credentials that recognize practical skills and competencies rather than rigid course completion. This approach can bypass some bureaucratic hurdles and better meet employer needs.

4. Adopt open and low-cost technologies:

   Utilise open-source platforms, mobile-friendly tools, and offline-compatible content to overcome digital infrastructure limitations.

5. Engage regulators early and often:

   Collaborate with policymakers to identify regulatory barriers and explore incremental reforms, such as recognition of prior learning or modular credential stacking, which can build trust and legitimacy over time.

6. Prioritise inclusion and accessibility:

   Ensure micro-credential programs reach marginalized groups by considering language, cost, digital access, and cultural relevance in design and delivery.

7. Develop clear pathways for credential stacking:

   Create transparent policies that allow learners to accumulate micro-credentials toward recognised qualifications, whereby increasing learner motivation and long-term impact.

8. Build awareness and employer buy-in:

   Conduct outreach to employers and communities to raise awareness of micro-credentials' value, helping to create demand and encourage recognition.

This study has focused on the voices of practitioners and their storied professional lives. However, the learner voice is limited to one and the employer voice is absent. Future research will benefit from a consideration of the employer voice in the development of micro-credentials as well as the voice of the end user, the learner.

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