Chapter 3
Keep Calm and Credential on: Linking Learning, Life and Work Practices in a Complex World

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Abstract This chapter will discuss the ideas and aims of higher education and the needs of the sector to continually innovate to meet workforce changes and labour market demands. The place of micro-credentials and open badges as approaches to locate, measure and validate learning within the academy are discussed. The affordances of technologies to map learning intentions and graduate outcomes of bodies of knowledge, skills-based tasks, and values acquisition at various levels of granularity are raised. The imperative to link learning, life and work practices for continued professional development and growth are highlighted. However, we raise cautionary tales about the use of competency-based approaches within the complexity of developing higher-order professional capabilities that require knowledge synthesis, abstract and novel ways of being, and the crafting of professional dispositions and identities through ongoing reflexive processes. Our key principle suggests that curriculum designs aimed to link ways of knowing, being, doing and valuing with ways of being practical in the world are important for life and professional practices. Finally, we suggest hopeful ways to keep calm and reflect on current approaches to digital badges and micro-credentialing acknowledging the many complexities of preparing professionals for practice.

Keywords Complexity • Accreditation • Professional ways of knowing • Being • Doing and valuing

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1 Introduction

University education for beginner professional practitioners is not only about accumulating discrete sets of skills and knowledge (Barnett, 1997, 2009) but historically about linking ways of knowing with ways of being, doing and valuing (van Manen, 1977). Another essential component of a well-rounded graduate is the ability to learn through inquiry and critique, and from a range of experiences, where possible. Here we borrow John Dewey's metaphor, life *is* education (Dewey, 1938) where contemporary learning occurs in a myriad of ways, settings, contexts, places and spaces. Digital badges and micro-credentials provide great opportunities for recognising content acquisition and certifying skills and knowledge (Gibson, Ostashewski, Flintoff, Grant, & Knight, 2013), however the latter capabilities may be more challenging to locate, map and validate for students, teachers and accrediting bodies. From this premise, the affordances provided by a range of educational technologies and other mechanisms to allow for potential employers to also verify that candidates are suitably skilled and knowledgeable for roles and types of work enables a more seamless transition from knowledge-based educational environments to employment. The inherent tensions between badging actual as well as more implied (and developmental) capabilities poses issues for the approaches that may or may not be adopted within a measured society.

Despite this increased need to verify skills and knowledge and the potential to be able to build more robust assurances about such competencies and capabilities of university graduates in particular, several hurdles limit micro-credentials and badges from becoming accepted by employers and professional accrediting bodies (Jovanovic & Devedzic, 2014). Among the primary concerns of these groups are that a collection of compartmentalised competencies does not necessarily mean that an individual can synthesise across these competencies and engage in higher-level evaluation and higher-order synthesis required for addressing professional issues (Dall'Alba, 2009). These problems allude to the difficulty of fragmented learning towards the development of students as professional practitioners (Eraut, 2009). This is an issue that has also been prevalent in the wake of discussions around the ongoing role of massive open online courses (MOOCs) moving into professional content areas in higher education (Lodge & Lewis, 2015). Our final point picks up on current debates about the increasing use of measurement systems on complex learning operations in higher education. Do we build micro-measurement indicators for a range of micro-competencies and then craft ways to integrate the data on professional learning? Is this the anathema to the development of a more holistic and integrated approach to professional practices? What role may technologies play in such crafting: be it through the development of sophisticated metrics and indicators, the harvesting of often de-contextualised data requiring interpretation to better understand student learning?

This chapter will delve into these epistemological and ontological opportunities and challenges facing the use of digital badges and micro-credentials in higher education as preparation for professional contexts and what this approach may tell us

about how we use, manage and manipulate data in higher education. We take as a starting point an integrated view of practice theory for professional development by Boud and Hager (2012), who critique that acquiring certain knowledge and skills and then transferring them in the real world does not work so well anymore. We work through the structural elements underpinning the need for an integrated body of knowledge, skills and values required for professional practice preferring an emphasis on the cultivation of professional autonomy and agency. Furthermore, we do not shy away from over-simplification of the individual, the unique and diverse nature of professional learning, and practices that make for richer and potentially innovative ways of being. In analysing these structures, we will highlight the most fruitful positioning of digital badges and micro-credentials within a broader epistemological perspective. We conclude with a set of strategies to allow for the integration of micro-credentials and badges into coherent and synthesised bodies of professional knowledge.

1.1 Micro-credentials in Higher Education

Notwithstanding the increased need to verify a range of knowledge-based skills as discussed above, there are numerous issues with the current state of higher education that call into question the traditional structure of the degree program (Bates & Sangra, 2011). While this is particularly true of liberal arts programs (Roth, 2014), there has been discussion about the suitability of degree programs and indeed of university education more broadly. There are several reasons for this. Firstly, it is clear that technology is fundamentally changing the relationship between knowledge and work, which has profound implications for higher education (Laurillard, 2002). Declarative knowledge is now readily available via myriad devices with the trend towards integration of these devices into every facet of daily life showing no signs of slowing. Secondly, the traditional broad undergraduate higher education has been supplanted by a more vocational focus with many disciplines and fields moving from work-based training, the vocational sector into higher education requiring degrees as entry to work or a right to practice professionally. As a result of these trends, in combination with the increased marketization of higher education globally, there is sufficient impetus for rethinking the traditional university degree and the balance of vocational and liberal foci. How to achieve this has however remained a topic of some conjecture with no clear path to resolving the complications associated with such a shift away from the traditional model of higher education.

After decades of a more vocational trend in higher education through undergraduate degree programs and right to practice graduate entry master programs, current trends across at least three of the predominant eight research universities in Australia are challenging the disciplinary breadth of vocational degrees, preferring to renew curriculum efforts and offer degrees with a stronger focus on breadth of knowledge. These trends mentioned above create conditions that require a rethink

of university education, and a robust discussion on the place of smaller, more focussed credentialing of graduates leaving the university. A graduate may in fact be too knowledgeable but in an overly theoretical and abstract way (Litchfield, Frawley, & Nettleton, 2010) or they may be better able to manage complexity and uncertainty but unable to be pragmatic about workplace demands. In particular, employers are increasingly demanding that graduates align with the culture of an organization (Cubiks, 2013), a requirement that is near impossible for universities to meet given the diverse and amorphous nature of organizational cultures (Robbins, Judge, Millett, & Boyle, 2014). While cultural 'fit' might be difficult to quantify in any meaningful way, it might be possible to quantify other aspects of work readiness. Within this context, there is some sense in developing credentials at the smaller level of granularity. For example, if an individual can use a particular computer programming language, it will be of interest to prospective employers to know specifically what language it is, to what level of detail the graduate can currently function with it, and what their further potentiality may be.

Is this reflective of changes to work roles in the modern knowledge-based society? In general, work and learning are becoming increasingly complex, requiring a diverse set of skills. Both are seeing changes to what and how we work, with a sharper focus on recognizing and utilizing socio-material contexts to understand practice (Fenwick, 2012). This is perhaps no more evident than in higher education itself, where faculty are increasingly being required to develop more sophisticated pedagogical knowledge and technical skills perhaps not required under the previous (and largely now outdated) lecture/tutorial/laboratory model (Laurillard, 2002). With the increasing use of educational and other technologies to support curriculum aims, we see a blurring between the once distinct social structures of higher education on one hand, and the use of material things on the other. This situation is symptomatic of the increasingly complicated demands placed on graduates when they enter the workforce.

Employers broadly are looking for a range of quantifiable skills that will allow graduates and employees to quickly get underway on projects or other work activities, often within a socially situated context. Which style of degree, mode of delivery, assessment and feedback mechanisms would provide sufficient guarantee that graduates have the requisite skills in the evolving labour market? What combination of degree offerings across the range of higher education providers may be able to meet current and perceived labour market trends? In what ways can the more granular credentialing through badges, for example, lead towards fostering reflective learning and professional identities for individuals and groups?

1.2 Credentialing Professionals

Micro-credentials and digital badges may be seen to fill a gap between the stated and desired outcomes within a broad undergraduate degree and the skills, knowledge and competencies that employers are seeking in graduates. The question

remains however as to where micro-credentials and digital badges fit within a broader higher education ecosystem. Can a sub-set of micro-credentials be cobbled together to create a program of study that will effectively prepare graduates for professional practice? Are micro-credentials and digital badges a way of up-skilling parallel to and beyond the degree, or will they eventually go part of the way to replacing it? If these skills are predominantly procedural in nature, how do they co-exist with vocational qualifications? While these questions will no doubt resolve in time, currently there remains some uncertainty about how micro-credentials will contribute to the preparation of both professionals and educated citizens of society (see also Craig, 2015).

By definition, professionals are employed to do knowledge-based work that is more deeply rooted in a theory-practice-reflexive dialogic than that expected for example of a tradesperson. Competency-based credentialism is a fundamental aspect of the recognition of practice-based trades and those holding similar vocational qualifications. A trade, in many respects, can be seen as a collection of competencies that are signed off over the course of an apprenticeship or traineeship. Given the compartmentalised nature of these qualifications and the lack of any need for a comprehensive underpinning theoretical framework, micro-credentials seem to be appropriate for this context. A trade qualified chef for example could provide evidence of competence in different cuisines, in baking, pastry cooking, managing the affairs of a commercial kitchen, etc. The combining of a set of competencies in this way, on the surface at least, would appear not to be viable when the point of university education is to develop a broad and deep understanding across and within a body of disciplinary knowledge. This is particularly so when this disciplinary knowledge is to be applied in a professional context into an unknown future.

The apparent disconnect between the notion of competencies and the purpose of higher education as a mechanism for educating professionals has been problematic for some decades. The increasing cost of a higher education globally has led to increased demand from students that their higher education will lead to employment as a professional. The credential therefore becomes the ticket for professional practice rather than a step in what is a lifelong journey to becoming a proficient professional practitioner. In this regard the very nature of the degree program could be considered to have shifted from the beginning of a larger journey to becoming a professional to a threshold, a barrier that, once crossed, leads to a competent and work-ready professional. Herein lies a fundamental shift in the purpose of a degree and the aspects, whether they be epistemological or administrative that exist within a degree program.

The greater focus on professional as competent on graduation is at least partly driven by accrediting bodies as well as the companies and industries that employ graduates. A sharper focus on the threshold created at the conferral of a degree, and away from the notion that post-secondary education is a much longer journey, is doubtless due to the increased influence of professional and industry bodies that have a financial stake in aspects of the profession. The result is an extended list of capabilities that professional bodies and employers seek to have embodied in graduates. For better or worse, these lists begin to resemble the list of competencies that

are required of tradespeople. To delve into why it is problematic to carve up a degree program into smaller pieces, in the next section, we will explore theoretical notions of 'practice' and also revisit what it means to have a higher education.

1.3 What Is Practice? Linking Preparation and Practice

In thinking about learning and teaching in higher education as a form of practice whilst simultaneously preparing graduates for practice-based societal roles, we need to explore a definition of practice within the larger discussion of credentialing for professional practice. Schatzki suggests that practice is "embodied, materially mediated arrays of human activity centrally organised around shared practical understanding" (2001, p. 2). Within this definition and the broader super-complex social and cultural environments, the looming issue is how best to measure whether or not a graduate is capable of crafting their practices in such an environment? Although there now exist far more sophisticated methods for data collection and integration than has existed ever before, making meaning of this data in a higher education context can still be viewed as problematic (Lodge & Lewis, 2012). The flow on effect of this is that inefficient measures are being used within the university context for a range of purposes from assessment to teaching evaluation (Lodge & Bosanquet, 2014). Under these circumstances, it is difficult to make sense of student progress at the micro level of an individual task and, even more so, across an entire program. Given these issues, it is difficult to see how micro-credentials can contribute towards the kinds of understandings that are required of the twenty-first century professional. Is there meaning to be taken from the level of granularity at which these competencies are likely to be assessed? We argue that the problematic nature of measurement in higher education as it already exists will further complicate the difficulty of implementing credentials with a greater level of granularity. Even if the assessment of these credentials occurred at a potentially measurable behavioural level, what does that mean for practice in vastly complex professional roles?

2 Higher Education as Way of Knowing, Being and Doing

As opposed to other levels of education and particularly to vocational qualifications, the purpose of higher education is not just of developing inert or loosely related knowledge or skills, it is a process of becoming (Barnett, 2009). This is discussed in many contexts in higher education, for example, the process of becoming an independent scholar through the PhD journey (Gardner, 2008); or the process of becoming a professional, for example, a nurse (Duchscher, 2008) or developing implied identity as an engineer (Khosronejad, Reinmann, & Markauskaite, 2015). An effective higher education experience will engage the whole person (Dall'Alba & Barnacle, 2007) not just assist them to develop decontextualized competencies. We

focus our attention here on the place of micro-credentials as an alternative to the status quo that is degree programs. The issue of micro-credentials as supplementary to formal qualifications as they are currently conceptualised will be taken up later in this chapter.

Barnett (1997) has long argued that the purpose of higher education is not simply to create workers with a set of job ready skills but to help students develop the critical thinking and other high level cognitive skills to prepare them not just for functioning in a job on a daily basis, but to be critique and extend the profession and continue as lifelong learners. This is more aligned with the traditional notion of a 'higher education'. It is an argument that has been echoed by numerous other scholars of higher education (e.g. Dall'Alba & Barnacle, 2007; Haggis, 2006; Molesworth, Nixon, & Scullion, 2009).

2.1 Ontology of Higher Education

Ways of knowing, being and doing are used in a range of contexts surrounding the academy. If we use writing as an example, there are ways of being a writer, knowing about writing and the act of doing writing. This example is explored by Henderson (2014) who suggests that the personal and professional transformations through the acts of doing things, particularly writing, are fundamental to twenty-first century practices of education. Placing writing in most if not all university courses, and professional practice roles, then it is a useful way to inquire into the more abstract, transformational and nuanced experiences of individuals developing knowledge, skills and confidence with writing. Such attempts at transformational education are often purposely designed and facilitated, with a range of feedback mechanisms in place. Whilst the mechanics of writing need to be learned and applied, we need to construct and structure our ideas as a process when writing, which may also become the product. We write to develop a voice, to explore our ideas, play with our fluid identities and to enact reflective practices whether we are the student, the researcher, the practitioner or the person.

Micro-credentials and badges that can enable visibility of the subtle nuances and gradations of the formation of practices may have a motivating effect on learners without it feeling like performance criteria. For example, Clayton, Iwata & Saravani outline approaches where digital indicators (badges) are used to "recognise, validate and reward learners" (2014, p. 706). They situate their assumptions within the personalised learning environment suggesting shifts in responsibility from educators to participants enables learners to be more self-directive, self-motivated (Clayton, 2012), and build more personalised career development plans. Within these technology-driven approaches the potential role of badging can be automated, where data and meta-data are recorded, analysed and stored, often in summative and cumulative ways. This affordance lends itself to assurances of certification in workplace training environments, and in particular, through the use of online professional development modules. We can take this further into a range of

professional roles, for example, should we be auto-badging the role of the PhD supervisor, badging a set of skills, for example, library skills (Rutherford, Freund, Jenks, & Mewburn, 2015). Another example is digital-badging the role of the performance evaluator's of continuing professional development in professional groups, for example, teaching or medicine (Davies, Randall, & West, 2015)? What is the requisite knowledge and understanding expected to be an evaluator/assessor of others?

The process of becoming a professional is more than just a matter of collecting a number of inert competencies. 'Becoming' is also about taking what is learned during the process of completing higher education and incorporating that into a renewed or refined sense of self as a professional in the world, often as a multi-professional person. Dall'Alba and Barnacle (2007) called for an 'ontological turn' in higher education marked by an increased emphasis on *becoming* as opposed to a process of collecting skills and knowledge. It is not clear how micro-credentials and badges contribute to what is a more global and holistic process advocated by Dall'Alba and Barnacle. Our contention is that the implementation of these innovations in a higher education context must proceed with caution. Dall'Alba and Barnacle's call for an ontological turn occurred in the time before micro-credentials had any impact on discussions around the current state and future of higher education. Thus, the ontological implications of the implementation of these innovations have largely remained unexplored to our knowledge. These implications need to be addressed before micro-credentials and badges can be formally integrated into higher education.

2.2 Epistemologies of Practice

Ontology aside, a separate issue around the cohesiveness of a body of knowledge, compartmentalised further than what is already evident in a degree program, is an issue for micro-credentials in this context. We here explore what the epistemological underpinning of a degree program is, and to an extent, what it ideally should be in order to understand how micro-credentials might fit within this context.

In most parts of the world, accrediting or oversight bodies set a framework for use in designing educational qualifications at different levels. In the United Kingdom for example the Professional Skills Framework (UKPSF) identifies the diverse range of teaching and support roles and environments in higher education that leads towards improving teaching quality and the student experience. In Australia, the Tertiary Education Quality and Standard Agency (TESQA) is tasked with ensuring that degree programs are delivered at the appropriate level of knowledge according to the Australian Qualification Framework (AQF, 2013). Like the UKPSF, the AQF sets out the standards of knowledge and skills for universities who design and deliver all post-secondary qualifications. What many of these frameworks for accreditation have in common is that higher education qualifications tend towards higher modes of evaluation, analysis and the creation of new knowledge.

Treating bodies of knowledge as lower-level compartmentalised packages becomes a challenging issue in this regard. This is due to several complicating factors, the most obvious is that students must develop extensive prerequisite knowledge in order to conduct an effective analysis of an issue or concept. Without this requisite knowledge, it is difficult to enact thinking that is reminiscent of an expert professional. These frameworks provide the scope to create programs of education that allow for the base knowledge to be acquired before students progress to higher levels where the knowledge is synthesised and they are given opportunities to test the knowledge and explore ways it can be put into practice. Without this larger structure, there is a risk that the required synthesis will occur thus undermining the core purpose of the holistic body of knowledge that has traditionally been covered in a degree program.

Considering the epistemological implications of micro-credentials and badges on the body of knowledge covered in degree programs becomes more complicated when considering what professional practice in the twenty-first century looks like and the ways we can imagine it being reshaped. One example of the changing nature of professional practice is that of the T-shaped professional. Hansen and Von Oetinger (2001) argue that many professions now require diverse skills and knowledge that moves beyond the focussed expertise of professionals of the past. By this it is meant that the vertical stem of the 'T' is a deep, coherent knowledge of a core discipline complemented by breadth across other areas, represented by the horizontal top section of the 'T'. These types of professionals are symptomatic of the increasingly complex nature of professional roles, which require creative crafting of skills and knowledge across multiple disciplines, dimensions and bodies of knowledge.

3 Strategies for Integrating Micro-credentials

The focus of this chapter thus far has been to consider the ways in which micro-credentials might supplant the traditional degree program. Moving on from this discussion, we now examine the ways in which micro-credentials and badges might complement the aspects of higher education that are important for developing competent professional who are also good citizens and are equipped for lifelong learning. In doing so, we will explore the use of micro-credentials and badges in three domains; knowledge synthesis, professional development and upskilling/reskilling.

3.1 Knowledge Synthesis, Analysis and Interpretation

One advantage of a degree program that is effectively horizontally and vertically integrated is that the connections between various aspects of the profession and of practice are made clear. This clarification of this integration is important for several

reasons. One is that students are better able to understand the purpose of the degree program. A sense of purpose has been shown to be important for student engagement (Horstmanshof & Zimitat, 2007). Of more relevance to our argument is that a properly aligned degree program will allow both students and faculty to see how the body of knowledge is brought together and executed in a professional context. This level of synthesis is important because, without it, comes a fragmented body of knowledge that is unlikely to be suitable for the effective and adaptive professional.

Reflective practitioners and professionals need to be able to see big pictures and engage in both the synthesis of knowledge and in analysis of a range of ways to interpret and understand phenomena. The question therefore is: how can opportunities be created where students get to enact synthesis, analysis and interpretation? One possible way to integrate micro-credentials and traditional degree programs is to use micro-credentials in a way that resembles the structured approaches created by prerequisites. By this it is meant that foundational knowledge and skills could be credentialed meaningfully with appropriate assessment and the synthesis aspects of the required knowledge fulfilled by a capstone experience or capstone task. In this way, both the fundamental knowledge aspects of the degree program can be captured with an opportunity for students to bring the compartmentalised knowledge components captured in the smaller level competencies in a larger project or authentic experience. Such an approach is quite common for meeting these aims, but does beg the question of whether the use of micro-credentials and badges in this way is an advance over a subject or unit level of granularity that is already captured and quantified within degree programs as they currently exist?

3.2 Professional Development

Perhaps a more promising approach to incorporating badges and micro-credentials into higher education might be in the creation of further professional development. The postgraduate qualification is now often seen as the prerequisite level of education for admission to the profession. For example, it is increasingly the case that in order to be a registered psychologist, 2 years of post-degree study and extensive, supervised clinical experiences are required. There is a possible place for micro-credentials and badges in this context. Graduates who are already qualified in a discipline but need to build on the foundation they acquired in their undergraduate education may find much value in being able to present certification for a finer level of knowledge and skill that builds on what they gained during their degrees. The assumption in this approach is that these professionals already have the body of knowledge that make up the discipline and are instead enhancing their capabilities in the profession incrementally by accumulating new knowledge and skill or becoming a specialist in a particular area of practice.

The use of micro-credentials and badges in this context could resemble something like a nested postgraduate program where students draw on what they learned

in their undergraduate degree program and either learn to apply that knowledge in a specific practice context, or further specialize with structured education in a particular area. We see the role of badges and micro-credentials here as a way of offering some of the benefits of postgraduate programs by breaking them into smaller pieces allowing for busy professionals to continue to develop and quantify their development in a formal higher education environment, without the commitment of a full postgraduate qualification.

There is one caveat to what we propose here. Postgraduate qualifications offered to professionals from outside their professional area (i.e. students who did their undergraduate education in a different area) would need to consider the use of micro-credentials and badges very carefully in this context. The ability to understand the body of knowledge holistically is also going to be important for postgraduate programs where students are having their first exposure to the discipline. As we have already discussed in relation to undergraduate programs, breaking up the degree into smaller credentials risks losing this synthesis and would need to be considered carefully.

3.3 Up-Skilling or Re-skilling

The ongoing process of academic inflation means that more professionals now need to upskill than was true in previous generations. Being qualified to the undergraduate degree level is often seen as insufficient for practice in many professions. Postgraduate programs and targeted professional development are areas where badges and micro-credentials might be useful, as discussed above. A greater proportion of the population now needs to be skilled and have knowledge in more than one disciplinary area of practice. The rise of the T-shaped professional, as described earlier, is an example of how this is enacted in the workplace. Badges and micro-credential could certainly have some impact on these professionals being able to prove they have proficiencies in breadth and depth beyond their core profession.

While it may seem obvious that there is scope for credentialing professionals in areas other than those they were educated in, implementing this is also going to be challenging, particularly for universities. The traditional structures and practices of delivering higher education do not lend themselves to smaller packages of skills and knowledge as we have discussed. To attempt to build micro-credentials that will cater to those qualified in diverse areas will be a difficult proposition. The credentials need to build on the diverse professional knowledge and experience of the student population while simultaneously seeking consistent evidence across the group that each individual is competent in the skill or has acquired and can use the requisite knowledge. There is much potential for offering micro-credentials in this context but the level of knowledge required and the diversity students bring with them requires innovative models for institutions.

4 Conclusion

From our perspectives within the academy, badges and micro-credentials offer innovative ways for higher education providers to work towards assuring the competencies of graduates. We conclude however, that a reductive micro-credentialised approach for professional practice preparation and continuing professional development should be located within the more lower-order and/or vocationally skills-based activities that can be observed, measured and evaluated. We raise our concerns that this level of granularity does not provide sufficient promise to capture, monitor and accredit the nuances of the development of self through higher order processing required for professional practice roles, inclusive of the subtleties of the ways of knowing, being, doing, and valuing. These latter aims arise from a more holistic, integrated and reflexive approach to education and practice, implicit for complex and uncertain workplaces.

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