

CHAPTER 2

Pedagogy of microcredentials

Microcredentials are a new type of qualification with their own distinctive characteristics. Because of this, some approaches to teaching and learning, some pedagogies, are more appropriate than others. Both learners and educators need to acquire and develop new skills in order to make the most of this broad set of accredited courses. This chapter identifies the ways in which microcredentials differ from qualifications and other courses at higher education level and the implications of these differences for their production and presentation.

How to cite this book chapter:

Ferguson, R. and Whitelock, D. 2024. Pedagogy of microcredentials. In:
Ferguson, R. and Whitelock, D. *Microcredentials for Excellence: A Practical Guide*. Pp. 19–50. London: Ubiquity Press. DOI: <https://doi.org/10.5334/bcz.b>. License: CC BY-NC 4.0

Microcredentials are different

Education serves many purposes. It prepares learners to take their place in society, developing skills, knowledge and values that align with those of others and teaching them to be responsible citizens, contributors and innovators. More specific forms of education are used to build communities – these may be based on shared interests, on localities or on identification with a particular faith, sexuality or ethnic grouping. At a personal level, education is used to develop individuals, enabling them to reflect on experiences and build coherent learning journeys. The notion of developing a healthy mind in a healthy body (*mens sana in corpore sano* in Latin) has resonated in Europe since Roman times. Education can also be used to develop people as learners, exposing them to the diversity of knowledge, encouraging them to reflect on their assumptions, and motivating them to care about truth and knowledge.

Although microcredentials may do all these things to some extent, their main focus is on training people for employment and enabling the transition from learner to earner. In her detailed report on microcredentials, Oliver notes that ‘[m]any have raised the possibility that micro-credentials – non-formal signals of educational achievement – present an alternative solution to preparing for the future of work’ (Oliver 2019: 3). She goes on to say that:

employees really value work-integrated learning and curriculum that is industry-aligned and employer-validated quality. It may be the case that employees are in fact starting to value employer provision more than traditional providers with human resource leaders formally de-emphasising degrees and prioritising skills. (Oliver 2019: 13)

Of course, alignment with the world of work is not new for universities. They have long been aligned with the legal, clerical and medical professions. Polytechnics taught a wide variety of vocational subjects, and the range of such subjects taught at different higher education institutions (HEIs) keeps expanding. Work placements are integrated within many degree pathways, and there have been several other initiatives, such as the degree apprenticeships offered in England and Wales, that combine paid work with university study.

However, all these approaches are primarily designed for young people making the transition from full-time education to full-time employment. The age of these young people varies, but most undergraduate courses are designed for students under 25. Although the characteristics of this student population vary considerably from country to country, many universities will assume that their students have little experience of the world of work, few or no caring responsibilities, their primary focus during the working day should be on their studies, and any external commitments should not be prioritised over study.

These assumptions do not hold true for microcredential learners. If they are reskilling to take on a new job, or developing the skills necessary for promotion, they are likely to be studying while employed on a full-time, or part-time, basis. Their role as learner takes second place to their role as earner, so assignment schedules and deadlines will not be prioritised over work schedules and deadlines. If they are carers as well as learners, their commitments to others will also take priority.

Another characteristic of microcredentials is that, although this is not a requirement, they primarily run online. One reason for this is that the major platforms developed to host massive open

online courses (MOOCs) have invested heavily in courses of this type. MOOCs attracted a lot of learners (Shah 2020; Shah 2015) but their open aspect meant these courses could usually be accessed free of charge and so brought in little money. Supplementing the MOOC offering with short, credit-bearing courses for professionals introduced a new revenue stream. The Udacity MOOC platform introduced Nanodegrees in 2014 (Shen 2014), edX trademarked its MicroMasters in 2016 (Young 2016), Coursera announced its MasterTracks at its Partners' Conference in spring 2018 (Valli 2018) and FutureLearn went live with its first microcredentials early in 2020 (Stancombe 2020).

Studying online is a new experience for many learners. The rush to remote learning during the Covid-19 pandemic meant that many had bad experiences of poorly designed online courses put together at high speed by educators who were not trained or resourced to teach at a distance. Microcredential learners therefore need opportunities to experience the benefits of online learning and to see it at its best. To do this, they need to develop the skills that support learning in this way, particularly the skills associated with self-regulation. These include goal setting, strategic planning, time management and self-evaluation. Also, just as in a physical university, they need to be given time and support to orient themselves and to find their way around their learning environment.

An issue that must be addressed by online educators is 'the gap between the understanding of a teacher (or teaching team) and that of a learner' (Moore 2019: 34). This gap was named by Moore in the 1980s as 'transactional distance' and he argues that distance education (of which online education is a subset) 'is the methodology of structuring courses and managing dialogue between

teacher and learner to bridge that gap through communications technology' (Moore 2019: 34).

Not only is there a gap between the learner and the educator when studying online; there is also a distance between learners and their peers. Although this superficially seems to be a benefit – fewer opportunities for learners to engage in idle chit-chat – it has been clear for many years that students are more likely to persist with their studies if they feel involved. As Tinto (1997: 168) observes, drawing on multiple studies carried out over two decades, '[t]he more academically and socially involved individuals are – that is, the more they interact with other students and faculty – the more likely they are to persist'. On a university campus, some of these interactions take place simply because people are together in the same classroom, corridor or café. In online settings, these interactions must be planned.

One reason why microcredentials are likely to remain online is the flexibility that this offers for learners who must fit their study time around their job and family commitments. Asynchronous activities, which do not require everyone to engage at the same time, mean that online learning is largely independent of time and place. Learners have access to and can collaborate with experts and peers anywhere in the world, while participating at a convenient and appropriate pace (Harasim 1990; Wu & Hiltz 2004).

Being online means microcredentials have an international reach. For example, in her study of the MITx MicroMasters in Supply Chain Management, Moreno found that around a third of participants were from North America, with another third from Europe and Asia (Moreno 2019). This diversity means that microcredential courses need to account for an international audience. On an employment-focused course this means paying attention

to any laws, standards, needs and approaches that will only apply in one country, as well as avoiding figures of speech and cultural references that only some students will recognise.

As well as extending the international reach of HEIs, online courses such as microcredentials make learning accessible to those who would not be able to access physical campuses. The World Health Organization estimates that disability affects approximately 15% of the world's population (WHO and The World Bank 2011). The Open University in the UK, which is a distance-learning institution, reports that more than 16% of its students have a declared disability. This rises to 19% of learners on its OpenLearn platform, which provides a wide variety of open educational resources, including courses (Iniesto et al. 2017). These figures suggest that online courses such as microcredentials are more likely than other courses to have to consider the needs of disabled learners, and they are also more likely to attract students with very severe disabilities who would not be able to access a physical campus.

Another aspect of online study is it does not have the physical constraints that limit numbers on a conventional course at an HEI. There is no need to restrict numbers based on the size of a lecture theatre or seminar room, or to restrict enrolment to students registered at a specific university. These courses are often hosted on MOOC platforms and, like massive open online courses, they have the potential to register massive numbers of learners. At the same time, their presence on MOOC platforms may lead to the assumption that they should be cheaper than a conventional HEI offering. Neither of these assumptions will apply in all cases. However, when they do, the course design needs to take into account that the learner/educator ratio will not be as high as on other HEI courses.

The pedagogy of microcredentials is also influenced by their potential for stackability. Rossiter and Tynan note that:

Micro-credentials can be stacked towards larger units of competence or capability, in a format that is verified, secure and shareable with peers, employers and educational providers. (Rossiter and Tynan 2019: 2)

They add that:

a taxonomy is desirable to demonstrate relationships, such as product ‘stacks’ or ‘clusters,’ to articulate pathways between newer alternative forms of credentials and accredited award courses and programmes. (Rossiter and Tynan 2019: 5–6)

The issue of assessment and accreditation is a substantial part of pedagogy, and a significant challenge for microcredentials, which is dealt with in Chapter 7. Here, the focus is on the requirement that microcredentials should join together to make a more substantial qualification. This requires consideration of skills and progression, which will typically need to be related to national or international requirements such as those set out in the European qualifications framework, the QF-EHEA (European Higher Education Area 2021). Frameworks like these set out requirements for skills and competencies that cannot all be developed in a short course. Just as a series of short university courses designed for first-year undergraduates cannot be snapped together to create a complete degree, a series of microcredentials cannot be stacked into a larger qualification unless the requirements of that qualification are taken into account during the design and planning stage.

Overall, there are multiple aspects of microcredentials that should be taken into account when considering how teaching and learning will take place. These are not simply cut-down versions

of vocational degrees, segments of apprenticeships, or variants on company-specific workplace training. Any successful microcredential pedagogy will need to take into account that:

- cohorts are likely to be large;
- educator:learner ratios may be low;
- focus is on career, workplace and professional skills;
- learners are likely to have work and care commitments that take precedence over study;
- learners may be new to online learning;
- learners may have substantial relevant work experience;
- learners may want to stack microcredentials to form larger qualifications;
- learners require opportunities to interact with others;
- learners require skills in self-regulation;
- learners will be based in many countries;
- many learners will have disabilities that influence how and when they study;
- study is likely to be asynchronous (learners are not required to be online at the same time).

The following sections of this chapter address ways in which pedagogy can be adapted to meet some of these challenges, while subsequent chapters take a detailed look at other relevant issues, including learning design, student support, and assessment.

Pedagogies for the workplace

Shifts in society mean there is a continuing demand for courses that train workers in new skills. For example, ‘developments in artificial intelligence will require capabilities that span the humanities, arts and social sciences and science, technology, engineering

and mathematics' (Oliver 2019: 1). At the same time, '[d]emand for higher cognitive skills (creativity, critical thinking, complex information processing) is predicted to increase' (Oliver 2019).

Many microcredentials are designed for learners who are also earners (Selvaratnam & Sankey 2020). This means those who register may already have some degree of expertise in the subject, may have experience to draw on, and may be able to put what they are learning into practice immediately. They are more likely than younger learners to be aware of the importance of soft skills such as team working. In some cases, developing the skills and competences they need in their working life will be more significant to them than gaining academic credit or completing an entire course.

Chapter 5 introduces ways in which thinking carefully about potential learners and their contexts can be useful when designing a course. In particular, it helps with the selection of an approach to teaching and learning that is appropriate for the learners and their context. Pedagogies that are well suited to learners developing job-related skills include competency-based learning, case-based learning and conversational learning.

Competency-based learning

Competency-based learning is an approach that focuses on learners mastering a set of measurable outcomes. It therefore aligns well with the needs of those who aim to progress along well-defined career paths or who are studying subjects that are clearly structured. Progress is evaluated based on whether learners demonstrate they have acquired explicit and measurable competences that have been communicated to them clearly (Henri, Johnson & Nepal 2017). This includes the ability to apply that knowledge in

practical situations, such as their day job. Learners cannot move on until they have mastered prerequisite skills, which could be split over a number of microcredentials.

Henri, Johnson and Nepal (2017) review a wide range of research about the use of competency-based learning in engineering education. Engineering curricula are highly structured, with each subject building on previous ones, so this pedagogic approach has numerous advantages because it prompts students to progress at their own pace, frequently reviewing fundamental content. The approach is associated with lower dropout rates, more positive student attitudes, and an improvement in student outcomes. It also emphasises self-directed continuous learning, which is important in the 'lifelong learning' context of microcredentials.

The approach is easiest to implement in areas that already have defined sets of competencies. The curriculum should link these with professional skills required in the field, such as teamwork, communication and the ability to work under pressure. Assessment can be used to link the different competencies, so that learners are able to explore the relationships between them, rather than treating them as discrete units.

Case-based learning

Case-based learning is another approach suited to learners developing job-related skills. It takes the form of a guided inquiry (Srinivasan et al. 2007) involving a practical case, a problem or question to be solved, and a stated set of learning objectives with a measured outcome (McLean 2016). Some of the information and content that learners require to solve the problem is presented in the course; some is discovered by them as they address the problem

or question. The approach is superficially similar to problem-based learning but the process is more structured and supported. If students' approach takes them off course, facilitators bring them back to the main learning objective using guiding questions.

Students can also ask for advice from experts and are not left to their own devices. This makes links with the work environment – students find out when it is appropriate to investigate for themselves, and when it is appropriate to ask for support from others with more experience. Students also work in groups, which gives them opportunities to explore team-working skills such as group planning, timetabling and knowledge sharing. A multinational group of learners who are already working in the field may have a wealth of experience to draw on, which means that developing the skills to work with an online team may be as important to their development as the acquisition of subject knowledge.

When implementing case-based learning, educators need support to facilitate the process. 'The facilitator guides the participants in clinical decision-making by posing questions, eliciting opinions and stimulating a discussion, enabling exploration of their existing knowledge, skills and attitudes, but also to uncover gaps' (Topperzer et al. 2021). It is important that learners feel comfortable participating, and that the course environment is structured so they are willing to reflect, to share knowledge and experience, to present and discuss opposing viewpoints, and to explore gaps in their knowledge. Achieving this in an online environment requires careful attention to the use and structure of synchronous and asynchronous activities, guidance on communication and group working, modelling of appropriate behaviour by educators, thoughtful use of introductory sessions and ice-breakers, and regular reviews of group progress and interaction.

Conversational learning

Conversational learning can be applied in any field. Its particular relevance in relation to microcredentials, which typically run on MOOC platforms, is that it is a pedagogy of scale. When the first MOOC platforms were developed, there were three main ways of scaling learning. The first was by broadcasting lectures, which MOOCs could do by putting videos online. Broadly speaking, a lecture works just as well if there are 10 people or 10,000 in the audience. The second was the connectivist approach that underpinned the earliest MOOCs (Siemens 2005; Downes et al. 2008), linking networks of learners to build knowledge together. This way of structuring courses gives a lot of control to learners and is therefore challenging for people who are not already experienced self-directed learners (Milligan, Littlejohn & Margaryan 2013). The third was supported distance learning, employed at some distance-learning universities. This approach only works when there is money available to pay for tutor support.

The FutureLearn platform, which launched in 2013, was based on a fourth approach, making scale a benefit, rather than a challenge. Just as a telephone network becomes increasingly valuable as more people join, extending opportunities for communication, the aim of FutureLearn was to develop an approach that would mean that the more learners, the more value a course could offer (Sharples & Ferguson 2019). This approach makes use of the conversation theory developed by Pask (1976), which provides a scientific account of how interactions between language-oriented systems (such as tutorial groups or scientific communities) can enable a process of ‘coming to know’ by reaching mutual agreements.

Learning through conversation (Pask 1976) involves sharing and negotiating differences in understanding with the aim of constructing new knowledge and reaching agreements. For their interactions to be considered a conversation, learners must be able to formulate descriptions of their reflections on actions, explore and extend those descriptions, and carry forward the understanding to a future activity. An example would be two learners performing an experiment together, discussing the results and what went wrong, then planning how to re-run the experiment. Effective learning through conversation requires learners to reach agreements through a process of facilitated interaction and conversation.

Building on Pask's work, Laurillard developed the Conversational Framework (Laurillard 2002), which includes conversation at two levels: actions and descriptions. At the level of actions, a learner and one or more partners discuss a practical activity or model of the world. For example, a teacher might set a maths problem to solve or an historical event to interpret. Learners converse in the context of that model or problem, sharing experiences and interpretations. The aim is to coordinate the action so that learners' expectations and understandings mesh with the teaching materials. Teaching materials and models must be appropriately designed, relevant and provoke reflective conversation.

At the level of descriptions, learners converse about why things happen. They offer conceptions of their learning and question the understanding of others, aiming to reach agreement about their reflective understandings. At both levels, learners need to agree on clear goals and objectives. Although the process of learning through conversation is exploratory, with learners managing their own activities and reflective discussions, there is

an important role for an educator in proposing goals and objectives, creating suitable activities and models to explore, and facilitating discussions.

A conversational approach to learning engages learners actively. The focus is not on passive consumption of content (watching videos and reading text) but on active engagement. This can involve conversation, collaboration, reflection, experimentation and putting ideas into practice. Learners are encouraged to relate course content to their local context, to introduce different perspectives on material that relate to their own experience, and to share relevant resources. Course activities include opportunities to discuss topics, negotiate understanding and reach agreement where possible. Guided by educators, learners connect the theories and skills introduced by the course with their lived experience and, in the process, generate new knowledge and understanding.

This approach can be employed successfully with large cohorts, works well when study is asynchronous, draws on learners' existing knowledge, and can be applied in situations where there are relatively low levels of educator support for students. However, like competency-based and case-based learning, when it is applied online, learners will require study skills in order to study effectively and have the best chance of completing a microcredential successfully.

Online study skills

Students who enrol in a bricks-and-mortar university will often begin their time there with a 'Freshers' Week' or the local equivalent. This provides opportunities to meet staff and students informally, try things out in a low-risk way, explore their new surroundings, locate resources they will need to access while

working for their qualification, make connections with others and generally get settled in before starting their studies in earnest. Learners on a microcredential may only be planning to study for a few weeks, but they need opportunities to do similar things. This could involve setting time aside at the beginning of the microcredential, or including a pre-course induction period with optional activities.

This time set aside for induction can also offer study skill support for those who have never studied at post-compulsory level before, who have not done so for some time, or who are not confident about their ability to study successfully at this level. This may include advice on developing effective study strategies, reading and taking notes, thinking critically, preparing assignments and revising for assessment.

Those who have not studied online before will require support with this, and most learners will benefit from some initial guidance on how to use a specific platform and navigate the course itself. Depending on the course and their previous experience, all online learners are likely to need to set time aside to do the following things. In most cases, they will benefit from some guidance on these activities, and an acknowledgement that completing these activities will take some of their study time.

Set study goals. One goal will be to complete the microcredential successfully. However, learners are likely to have other goals, such as exploring one or two topics in more depth, gaining experience of a particular aspect, or making contact with other practitioners. Reflecting on their goals, and stating these explicitly, will help them to prioritise their work.

Manage time. Most microcredentials learners will have other commitments, so will benefit from putting important course dates (assessments due, or synchronous sessions) in a diary or calendar

at the start, blocking out times for study on a regular basis, and considering how to get ahead or catch up if it is necessary to work round a commitment that cannot be moved.

Workspace. Some microcredentials learners will already have a study space available at home or in the office. Others may need to negotiate access to a space that is comfortable, not too noisy, and has access to the internet. If they do not have reliable access to a good internet connection they may need to download course materials in advance, or be prepared to study whenever the internet is accessible.

Support. It is sometimes easier to study with others, by setting up a study group or by identifying another person who can be a 'study buddy'. Microcredentials learners might be able to do this in their workplace, especially if the company has registered a group of them on the same microcredential, or they might advertise in the course chat that they are looking for someone to discuss their study with, perhaps using a medium such as WhatsApp or Zoom.

Note-taking. Online learners may prefer to take their notes online, using a tool such as OneNote, Evernote or Google Docs; on their computer or tablet; or in a handwritten notebook. The decision will partly depend on personal preference and partly on context. They need to think ahead to avoid situations where, for example, they are studying at home but their notes are on a computer at work, or when their notes are online but they have no access to an internet connection during a study session.

Self-regulation

School students are used to teachers providing the structure, resources and motivation they need to learn. When they move to higher education, they take on more responsibility for their

learning, but will still rely on the institution and their educators for support with structure, resources and motivation. When studying at a distance, as most online learners do, more of the responsibility lies with the learner. This requires a new set of skills – those involved in learning to learn.

Learning how to learn involves being able to:

- decide what you need to help you learn
- manage your time
- set goals
- find valuable resources – including other people – to learn with
- choose learning strategies
- reflect on progress
- develop creative skills
- evaluate learning outcomes.

The skills involved in learning to learn are vitally important in today's society. In our rapidly changing world, there is a need for workers who are able to update their skills and who are willing to keep on learning throughout their lives.

Self-regulated learning involves learners taking responsibility for their own learning. This does not mean there is no role for the educator but it does mean that educators need to be aware of their responsibility to facilitate learning that aligns with the goals and contexts of individual learners. Zimmerman and Moylan, experts in this area, note that:

learning in self-regulated contexts can be challenging for students due to (a) competing activities, such as watching television or conversing with friends, (b) insufficient knowledge about how to proceed, (c) difficulty in judging the quality of one's learning, and (d) insufficient

incentives. These attention, retention, self-awareness, and motivation issues have been studied as important attributes of self-regulated learners. (Zimmerman & Moylan 2009: 299)

There are various descriptions of self-regulated learning, all of which draw attention to a personal feedback loop. Self-regulated learners reflect on feedback about their performance and use this information and reflection to adjust their approach. The feedback may come from the environment – did they complete the task successfully or not? It may come from other people, such as an educator or fellow learners. It may come from self-reflection and evaluation, or from all of these elements together.

Zimmerman and Moylan (2009) identify three phases to this feedback loop, which are repeated many times: the forethought phase, the performance phase and the self-reflection phase. Each of these can be broken down into different skills. For example, the forethought phase includes goal setting and strategic planning. The performance phase includes help-seeking, task strategies and time management. Self-reflection includes self-evaluation and attribution of reasons for success or failure.

None of these skills is fixed or innate – they can all be learned, practised and improved. Studies of learning in online settings have found positive correlations between academic achievement and self-regulated learning behaviour (Littlejohn et al. 2016). For example, Cheng and Chau (2013) find that some types of activity are associated with higher achievement. These included critical thinking, elaboration (including strategies such as note-taking, summarising, and paraphrasing), organising ideas and knowledge, and peer learning (asking for help from peers when necessary). Milligan and Littlejohn (2016) describe the behaviour of highly self-regulating learners in a MOOC designed for health professionals. These learners:

have a clear understanding of what they want to learn and how it will impact their career, job or personal development. These individuals assume control of their learning, monitoring their progress and adjusting their effort to maximise the benefit they gain from their studies. These learners go beyond the core tasks of the course, searching for additional resources and engaging with others in the forums to develop their ideas and grow their learning network. (Milligan & Littlejohn 2016: 120)

While it is beyond the scope of a microcredential to develop all these self-regulation skills, they can be incorporated into courses in several ways. Most important to bear in mind, when designing a microcredential, is that skills in learning to learn are not innate and that the ones required in an online context are unlikely to be the ones that learners acquired at school or university. Therefore, microcredential learners will need support in these areas. They will not necessarily understand the importance of activities such as time management or engaging with other learners, unless the benefits of these are made explicit. Even then, learners are more likely to complete these activities if educators show they value them. This can be done by mentioning these skills in the learning outcomes, setting aside time within the course to develop them, and assigning marks or credits for learners who demonstrate they have engaged with them. One or more learning-to-learn skills can be built into the syllabus of a single microcredential, or a stackable set of microcredentials, or links to appropriate resources can be supplied for those who want to develop as lifelong learners.

Overall, attention to skills in learning to learn can be used to address the problem that learners may be new to online learning and need to adapt to this setting. Some of these skills, such as time management and reflection, will help learners to overcome the challenge of having work and/or care commitments that need to

take precedence over their study. Others, such as strategic planning and help-seeking, will enable them to make use of opportunities to interact with their peers.

These skills are helpful for learners but even the most skilled learners cannot progress if they are unable to access the course or its resources. This means that educators need to pay attention to accessibility. One way of doing this is through paying attention to accessibility guidelines (see, in particular, those in W3C 2018); another is through the use of Universal Design for Learning.

Universal Design for Learning

The Universal Design for Learning (UDL) framework, initially developed in the 1990s, can help greatly when planning microcredentials. The framework promotes flexibility in learning and addresses some of the barriers to learner participation, engagement and wellbeing that can intersect for an individual learner and across diverse learner groups. The UDL guidelines (CAST 2018), which elaborate on the UDL framework, are research-informed and are frequently revised to incorporate new pedagogies, technologies and evidence about how people learn. Both the framework and the guidelines are based on research in the learning sciences. They are used to support the development of flexible learning environments that can accommodate individual learning differences.

UDL has its roots in universal design, which aims for all products and environments to be designed so that they can be used by as many people as possible without the need for special equipment or adaptation. The guiding principles of universal design include:

- equitable use
- simple and intuitive use
- flexibility in use
- tolerance for error
- low physical effort.

By extension, UDL takes the view that the curriculum should be designed to accommodate all kinds of learner. This can be achieved by providing:

- **Multiple means of engagement** with the subject and learning environment, to tap into learners' interests, challenge them appropriately and motivate them to learn. The UDL guidelines express this as the 'why' of learning.
- **Multiple means of representation** of learning materials, to give learners various ways of acquiring information and knowledge. The UDL guidelines express this as the 'what' of learning.
- **Multiple means of action and expression** in learning, to provide learners alternatives for demonstrating what they know. The UDL guidelines express this as the 'how' of learning.

In a microcredential, 'multiple means of engagement' means stimulating learners by, for example, providing varied ways of putting a theory or skill into practice, and opportunities to work both collaboratively and alone. A key focus will be on giving learners autonomy and control by offering a choice of ways to learn and heightening learners' interest by providing authentic and relevant learning experiences that relate either to their own context or to the work context for which the microcredential is preparing them.

‘Multiple means of representation’ means offering learning content in different formats so that learners can choose the format that they prefer. For example, when a text is included in the course, a video or audio covering the same content may appear as well. Alternatively, learners might be given a choice of ways to access learning content, for example by being asked to explore a subject using whatever resources they can find.

‘Multiple means of action and expression’ is also about choice. It means giving learners different options for demonstrating what they have learned, for example writing an essay, giving a presentation or recording a video. This can be challenging in a microcredential if it only includes one or two pieces of summative assessment. However, these final assignments or exams are not the only ways of demonstrating learning. Learners might be encouraged to share work in progress with their peers for comment; to contribute in different ways to a collaborative activity; or to reflect on what they have learned by creating an artefact such as a picture, video or mind map.

UDL is one of a range of inclusive pedagogies. It can be used to make microcredentials more accessible to a range of learners but it has at its roots a consideration for the needs of learners with disabilities. Thought also needs to be given to other aspects of inclusion, particularly the needs of learners who are not based in the country where the microcredential was created. This is very important for courses presented on microcredential platforms, as the experience of MOOCs has been that learners are likely to register from every country where this is possible, and the same presentation may include learners from a large number of countries (for example, Bayeck (2016) reported that students from 82 countries completed the pre-course survey on one MOOC).

Inclusive pedagogies

A systematic review of the literature on inclusive pedagogies in higher education (Stentiford & Koutsouris 2020) identified several ways of approaching inclusion. These include appreciating difference, making differences invisible, addressing the needs of diverse students, and democratising knowledge. These approaches can be applied to microcredentials in different ways.

Inclusion as appreciating difference (individuality)

Individualistic approaches acknowledge the variety of individual needs in a learning context and ensure learners are offered activities that suit them. This may result in different learning material and activities for different learners but aims to avoid marginalising particular students. These approaches are rooted in the belief that all learners can make progress under the right conditions. On a microcredential, this might include activities that learners can adapt to their own contexts, wherever they are based, or a variety of resources from which learners can make their own selection. The focus of any work on self-regulation skills within the microcredential is likely to be on helping learners to recognise and understand their own learning needs.

Inclusion as making differences invisible (commonality)

Approaches based on commonality aim to ensure the needs of all learners are met, or that they have choices about how they engage with their learning. This should allow for the same learning material and activities to be offered to everyone. The focus of work

on self-regulation is likely to be on supporting learners to make appropriate choices as to how they engage with these resources. UDL is an example of a commonality approach.

Inclusion as a way of addressing the needs of diverse students (procedural approaches)

This approach acknowledges that diverse students will be enrolled on microcredentials, so focuses on ways of enabling them all to develop a sense of belonging. This might involve activities that encourage learners to share their experiences, so that the entire cohort has an opportunity to reflect on how skills and knowledge are influenced by context and culture. Microcredentials taking this approach to inclusion would acknowledge the diversity of students enrolled on the course and offer learning opportunities that students would find culturally relevant.

Inclusion as the democratisation of knowledge

Approaches focusing on democratisation of knowledge challenge perceptions of the curriculum and what students are taught. These approaches draw on historical movements that challenge the notion of education being reserved for elite social classes, and align with the aspirations of many that microcredentials could help to open up education and provide gateways to other opportunities.

With a low entry barrier, micro-credentials could be the initial step for learners who might traditionally have been discouraged to enter the education system; they can also be the means to enable more fluid learning pathways, thereby realising the vision of lifelong learning. (European Commission 2020)

This approach to inclusion stresses that students with diverse backgrounds, circumstances and needs should see others like themselves reflected in the curriculum. This has implications for the content of the course, including the sources that are referenced, and the images that are used. Examples and resources shared by learners during one presentation of the microcredential can be built into subsequent iterations of the course, so that it not only becomes more inclusive but also richer and deeper.

Together, pedagogies for learning, the development of learners' study skills, and inclusive approaches address some of the main ways in which teaching and learning in microcredentials need to be different from other courses in order to meet the needs of the learners who are studying them. Another requirement, which straddles the boundary between learning design and pedagogy, is the desire for stackability.

Stackability

The aim for microcredentials to be joined together to earn learners more substantial qualifications is often central to how these courses are understood. The proposed EU standard for constitutive elements of microcredentials includes integration/stackability options (European Commission 2020). Oliver's (2019) description of 'An evolved 21C education system' includes 'the facility to stack and bank lifelong learning credit'. The Microcredential Roadmap created in Ireland refers several times to 'a more agile, flexible and stackable approach to training and professional development' (Nic Giolla Mhichíl et al. 2020).

Stackability implies that credits from one institution should be recognised by others, and that their value should remain constant. This would mean that learners could stack microcredentials

offered by different institutions, rather than being limited to those offered by one institution. Within the European Higher Education Area (EHEA), which covers 49 countries, the Lisbon Recognition Convention sets out regulations for academic recognition. The convention was agreed in 1997, before the emergence of microcredentials, but its terms imply that microcredentials ‘offered by accredited higher education institutions’ would fall within its scope (MICROBOL 2020: 33).

The existence of such frameworks around the world suggests that academic credit offered by microcredentials could be transferred between institutions in different countries, but there is still work to be done to ensure that the frameworks cover these courses. In addition, as the MICROBOL project notes in the quotation above, these frameworks are designed for the transfer of academic credit. Microcredentials’ position between the academic world and the world of work means that they sometimes lead to certification by professional organisations or companies. In the case of major multinationals, this makes international recognition easier in some ways, but limits stackability because the accreditation systems of different companies are not aligned.

In their analysis of accreditation approaches in the computing sector in England, Bowers and Howson (2019) demonstrate the challenges involved in aligning workplace accreditation frameworks with an institution’s internal framework, the national framework and the European framework. They also outline some of the certification levels awarded by different vendors, which include administrator, engineer and professional (LPI); fundamentals, associate and expert (Microsoft); and entry, associate, professional, expert and architect (Cisco). ‘Professional’ is the highest grade in some of these systems, but only a midway point

in others. Neither the terminology nor the levels can easily be mapped to each other.

Even within HEIs, stackability can pose problems. Qualifications are typically built from a limited set of options so that necessary skills can be acquired and evidenced over time. The set of skills required at any qualification level is usually defined at national or international level. For example, in England the Regulated Qualifications Framework sets out the criteria for qualifications at nine levels, from the most basic to a doctorate. In Europe, national qualifications frameworks for courses at university level are developed to be compatible with the framework of qualifications of the European Higher Education Area. On a global scale, qualifications are likely to be aligned with UNESCO's International Standard Classification of Education, a framework that applies uniform and internationally agreed definitions. However, once again, this is a framework that predates microcredentials, and so its criteria, which include entry requirements and course length, are not well suited to these courses.

Without the necessary over-arching frameworks in place, it will not be possible in most cases to build microcredentials that can stack with a wide variety of others. One approach will be to build sets of microcredentials within the same institution that can be combined in different ways to achieve a qualification. An example here is The Open University in the UK, which has a long history of enabling its students to select and combine modules from across the institution's curriculum to achieve an undergraduate or, more recently, a postgraduate degree (Di Paolo, Hills & Mahrra 2009). However, in that case the modules each involve 300 or 600 hours of study, so they cover more knowledge and skills than microcredentials. The courses are also levelled, so students build from

an introductory level to more advanced study, whereas microcredentials are typically positioned more broadly at either undergraduate or postgraduate level. Institutions building stackable sets of microcredentials, as The Open University is now doing (see Chapter 7), need to pay careful attention to the learning outcomes of each of these, and to how these can be designed (see Chapter 5 on learning design).

Another approach will be to position microcredentials as gateways to full qualification pathways. In this case, they can make entry possible for individuals who did not previously have appropriate entry qualifications; they can enable others to make significant changes in subject area; and they can act as taster courses. This approach requires a pedagogy that introduces students to study at this level, as well as introducing them to some of the basic conventions of the discipline and specific subject area.

Conclusion

Although the definition of microcredentials has not yet been standardised, elements that are common to many of these courses require a distinctive approach to pedagogy, rather than a replication of the approaches used for other forms of qualification. One of these elements is the focus of microcredentials on career, workplace and professional skills. Another is that most of these courses are offered online and so the pedagogy must be appropriate for online learners who may have not studied in this way before and need to develop a new set of study skills alongside their coursework. Another element is associated with the intention for microcredentials to open opportunities for new groups of learners, so any cohort of learners is likely to be significantly different in its demographics from a cohort engaged in other forms of education

or training. This chapter has shown how changes in pedagogy can address these issues. The following chapter considers ways of adapting and broadening pedagogy so that microcredentials really do open up learning and offer a range of new possibilities.

References

- Bayeck, R. Y. (2016). Exploratory study of MOOC learners' demographics and motivation: The case of students involved in groups. *Open Praxis*, 8(3): 223–233.
- Bowers, D. S. and Howson, O. (2019). *Analysis of accreditation approaches in the computing sector*. Milton Keynes: The Open University. Available at <https://oro.open.ac.uk/69220>
- CAST. (2018). *Universal Design for Learning Guidelines version 2.2*. Available at <http://udlguidelines.cast.org>
- Cheng, G. and Chau, J. (2013). Exploring the relationship between students' self-regulated learning ability and their ePortfolio achievement. *The Internet and Higher Education*, 17: 9–15.
- Di Paolo, T., Hills, M. and Mahrre, J. (2009). Changing lives on the 'degree of choice': Older first generation learners on the Open Programme. In: BERA Annual Conference, Manchester, UK, 2–5 September.
- Downes, S., Couros, A., Siemens, G. and Blackall, L. (2008). EdTechTalk#81 – The Mega-Connectivism Course (Part #1) (27 July). *EdTechTalk*. Available at <https://edtechtalk.com/EdTechTalk81>
- European Commission. (2020). *A European approach to micro-credentials – Output of the Micro-credentials Higher Education Consultation Group – final report*. Available at <https://education.ec.europa.eu/sites/default/files/document-library-docs/european-approach-micro-credentials-higher-education-consultation-group-output-final-report.pdf>.
- European Higher Education Area. (2021). *Qualification frameworks*. Available at <https://eha.info/page-qualification-frameworks>
- Harasim, L. M. (1990). Online education: An environment for collaboration and intellectual amplification. In: Harasim, L. M.

- Online education: Perspectives on a new environment.* New York and London: Praeger. pp. 39–63.
- Henri, M., Johnson, M. D. and Nepal, B. (2017). A review of competency-based learning: Tools, assessments, and recommendations. *Journal of Engineering Education*, 106(4): 607–638.
- Iniesto, F., McAndrew, P., Minocha, S. and Coughlan, T. (2017). What are the expectations of disabled learners when participating in a MOOC? In: L@S 2017, Cambridge, MA, USA, 20–21 April 2017.
- Laurillard, D. (2002). *Rethinking university teaching: A conversational framework for the effective use of learning technologies.* 2nd ed. London: RoutledgeFalmer.
- Littlejohn, A., Hood, N., Milligan, C. and Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. *The Internet and Higher Education*, 29: 40–48.
- McLean, S. F. (2016). Case-based learning and its application in medical and health-care fields: A review of worldwide literature. *Journal of Medical Education and Curricular Development*, 3: JMECD. S20377.
- MICROBOL. (2020). *Micro-credentials linked to the Bologna key commitments: Desk research report.* MICROBOL. Available at <https://eua.eu/downloads/publications/microbol%20desk%20research%20report.pdf>
- Milligan, C. and Littlejohn, A. (2016). How health professionals regulate their learning in massive open online courses. *The Internet and Higher Education*, 31: 113–121.
- Milligan, C., Littlejohn, A. and Margaryan, A. (2013). Patterns of engagement in connectivist MOOCs. *MERLOT Journal of Online Learning and Teaching*, 9(2): 149–159.
- Moore, M. G. (2019). The theory of transactional distance. In: Moore, M. G. and Diehl, W. C. *Handbook of distance education.* New York: Routledge. pp. 32–46.
- Moreno, A. (2019). *Predicting student dropout in a MicroMasters program.* Thesis, MIT. Available at <https://hdl.handle.net/1721.1/122250>
- Nic Giolla Mhichíl, M., Brown, M., Beirne, E. and MacLochlainn, C. (2020). *A micro-credential roadmap: Currency, cohesion and*

- consistency*. Dublin City University. Available at <https://www.skillnetireland.ie/wp-content/uploads/2021/03/A-Micro-Credential-Roadmap-Currency-Cohesion-and-Consistency.pdf>
- Oliver, B. (2019). *Making micro-credentials work for learners, employers and providers*. Melbourne: Deakin University. Available at <https://dteach.deakin.edu.au/wp-content/uploads/sites/103/2019/08/Making-micro-credentials-work-Oliver-Deakin-2019-full-report.pdf>
- Pask, G. (1976). *Conversation theory: Applications in education and epistemology*. New York: Elsevier.
- Rossiter, D. and Tynan, B. (2019). *Designing and implementing micro-credentials: A guide for practitioners*. Commonwealth of Learning. Available at <https://oasis.col.org/items/e2d0be25-cbbb-441f-b431-42f74f715532>
- Selvaratnam, R. M. and Sankey, M. D. (2020). An integrative literature review of the implementation of micro-credentials in higher education: Implications for practice in Australasia. *Journal of Teaching and Learning for Graduate Employability*, 11: 1–17.
- Shah, D. (2015). *By the numbers: MOOCS in 2015* (21 December). Class Central. Available at <https://www.class-central.com/report/moocs-2015-stats>
- Shah, D. (2020). *By the numbers: MOOCs in 2020* (30 November). Class Central. Available at <https://www.classcentral.com/report/mooc-stats-2020>
- Sharples, M. and Ferguson, R. (2019). Pedagogy-informed design of conversational learning at scale. In: ECTEL, Delft, Netherlands, 16–19 September.
- Shen, C. (2014). *Introducing Nanodegrees* (16 June). Available at <https://www.udacity.com/blog/2014/06/announcing-nanodegrees-new-type-of.html>
- Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1).
- Srinivasan, M., Wilkes, M., Stevenson, F., Nguyen, T. and Slavin, S. (2007). Comparing problem-based learning with case-based learning: Effects of a major curricular shift at two institutions. *Academic Medicine*, 82(1): 74–82.

- Stancombe, S. (2020). *FutureLearn launches microcredentials with six global partners* (11 Feb 2020). Available at <https://www.futurelearn.com/info/press-releases/futurelearn-launches-microcredentials-with-six-global-partners>
- Stentiford, L. and Koutsouris, G. (2020). What are inclusive pedagogies in higher education? A systematic scoping review. *Studies in Higher Education*, 46(11): 2245–2261.
- Tinto, V. (1997). Colleges as communities: Taking research on student persistence seriously. *The Review of Higher Education*, 21(2): 167–177.
- Topperzer, M. K., Roug, L. I., Andrés-Jensen, L., Pontoppidan, P., Hoffmann, M., Larsen, H. B., Schmiegelow, K. and Sørensen, J. L. (2021). Twelve tips for postgraduate interprofessional case-based learning. *Medical Teacher*, 44(2): 130–137.
- Valli, H. (2018). *Bold new initiatives from the Coursera conference* (29 March). Available at <https://learninginnovation.duke.edu/blog/2018/03/bold-new-initiatives-from-the-coursera-conference/>
- W3C. (2023). *Web content accessibility guidelines (WCAG) 2.2: WC3 recommendation*. Available at <http://www.w3.org/TR/WCAG>
- WHO and The World Bank. (2011). *World report on disability 2011*. Available at <https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/world-report-on-disability>
- Wu, D. and Hiltz, S. R. (2004). Predicting learning from asynchronous online discussions. *Journal of Asynchronous Learning Networks*, 8(2): 139–152.
- Young, J. R. (2016). *Degrees of the future – and what’s at stake for students* (3 November). Available at <https://www.edsurge.com/news/2016-11-03-why-udacity-and-edx-want-to-trademark-the-degrees-of-the-future-and-what-s-at-stake-for-students>
- Zimmerman, B. J. and Moylan, A. R. (2009). Self-regulation: Where metacognition and motivation intersect. In: Hacker, D. J., Dunlosky, J. and Graesser, A. C. *Handbook of metacognition in education*. Routledge. pp. 299–315.