The role of higher education in upscaling global professional development through open, online collaboration[1]

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Introduction

This chapter focuses on the way digital interventions are opening up new roles for universities. In particular we report on the potential of MOOCs (massive open online courses) as a powerful form of digital intervention transforming the University's relationship to professional development and knowledge exchange, and helping to deliver on the UN's (United Nations, 2015) Sustainable Development Goals (SDGs).

The chapter begins with a discussion of the potential and limitations of MOOCs as a model for online education. We assess the extent to which MOOCs can be effective for undergraduates and professionals, and argue that while MOOCs may not currently be viable for teaching the former *en masse*, they could be developed as an effective mechanism for creating collaborative online (professional development. We present a series of case studies of teacher professional development (TPD) MOOCs to illustrate this potential, particularly for addressing the global crisis in TPD (Moon and Villet, 2017). We draw on a second set of case studies of MOOCs for health care professionals to explore the extent to which MOOCs can bring researchers and end-users into a closer, more participative research model. We

[1] Chapter 11 in *The Future of Higher Education***,** Edited by Claire Callender, William Locke and Simon Marginson, Bloomsbury Higher Education Series, London, 2019.

show how these digital interventions enable universities to go beyond the unidirectional forms of dissemination, towards dialogic engagement with current research processes on the large scale.

Meeting the global challenge for the digital university

Digital technology makes most impact when it contributes to addressing our greatest challenges in global inequality. The UN's Agenda 2030 sets out for the first time an explicit role for higher education within Sustainable Development Goal 4 (SDG4), i.e. to provide 69 million teachers to enable every child access to primary and secondary education (UNESCO 2016). Higher education can also meet other sustainable development goals (SDGs) through training professionals in fields such as healthcare, education and engineering. To do this, however, higher education needs to scale in a way that is inconceivable without digital technology (Laurillard, Kennedy, Wang, Escorcia, & Hooker, 2018).

This chapter explores some of the ways digital technology could potentially enable higher education to deliver on the SDGs. Digital methods have completely transformed university research in all disciplines over the last few decades, but they have not yet transformed the way researchers interact with research users. We therefore examine how MOOCs might provide new forms of genuine knowledge *exchange* (rather than one-way dissemination) between higher education and professionals on a massive, global scale. We argue that this could be a future model for a way in which higher education could act as a global common good (UNESCO, 2015), because it emphasises the participation of both academics and professionals in the construction of shared knowledge products through engagement in an online space.

To begin this process, we explore the limitations of MOOCs as an equivalent to traditional university education and show the extent to which they might meet the aims of a

new approach to public engagement. We examine a series of case studies from a range of MOOCs (Massive Open Online Courses). We use multiple methods which include cycles of Design Based Research (Anderson & Shattuck, 2012) that involve embedding pedagogical theory and findings from previous studies into the design of MOOCs, and evaluating the success of the learning design through the analysis of quantitative data from the platform and qualitative data from participant contributions during the course and interviews with selected participants. In this chapter we present evidence from MOOCs we have designed and evaluated ourselves as well as MOOCs designed by others. The next section reviews findings from existing research to argue for a move away from conceiving of MOOCs as having potential for scaling up undergraduate campus-based higher education to considering their merits for delivering a new kind of collaborative online knowledge exchange with professionals.

MOOCs as a method for online education

The development of platforms for massive open online courses (MOOCs) in 2012 brought the potential of large-scale online education to the attention of university leaders and education policymakers for the first time. The distance learning Open University in the UK[1] has been the most successful higher education contribution to adult education in the world, raising the education ambitions and achievements of over 2 million learners. Yet distance learning was never seen as a key strategic issue for higher education. When a few top universities began to experiment with MOOCs, all top universities took an interest in what this meant for them (Hollands & Tirthali, 2014). This new type of course offered high quality teaching from respected academics, and because they were free, open to all, and online, the numbers of learners were indeed massive, sometimes over 100,000. For the universities that entered the market the primary value was marketing, although the costs were not obviously

commensurate with the return in terms of profit from additional student recruitment. This was an opportunity for innovation, however, and led many academics, oblivious to the negative bottom line, to experiment with online learning, and thereby discover methods that could be of value to their campus learners as well (Macleod, Haywood, Woodgate, & Alkhatnai, 2015).

The great expectations of MOOCs, that they could solve the problem of widening participation in higher education, were quickly thwarted. The data on MOOC demographics showed that MOOC participants were not typical undergraduates: the great majority (80 per cent) were graduate or postgraduate professionals (Hollands & Tirthali, 2014).

Moreover, the pattern of participation in MOOCs was very different from typical university courses, whether face to face or online, showing high levels of attrition with participation steadily falling as the course progressed (Clow, 2013). Further analysis indicated, however, that patterns of engagement in MOOCs were related to participants' motivations which were not the same as undergraduates' (Kizilcec & Piech, 2013). Comparisons with persistence in other course contexts, therefore, are untenable since they make the assumption that motivations are driven by pay-offs, such as qualifications, that do not hold for MOOCs (Kizilcec & Schneider, 2015). In addition, enrolment requires neither cost nor commitment, as degree courses do. It is closer to the 'enquiry' stage of degree enrolment. Lack of time is the principal reason given for drop out (Kizilcec & Halawa, 2015) and over half of participants do not enrol with the intention of gaining a certificate (Kizilcec & Schneider, 2015). For time-poor professionals, the goal may simply be to engage as much as is feasible and justified alongside their other commitments.

As a method for online education, MOOCs are a less viable proposition for undergraduates. Being massive and open, MOOCs are not able to support all of the conditions for learning to take place as identified by Laurillard (2012), since individual

feedback from the tutor is not available at scale and must be supplemented by peer learning and self-regulated learning. While self-regulated learning is a behaviour that needs to be carefully scaffolded in undergraduate education (e.g. through dialogic tutor feedback), in MOOCs it must already be highly developed for students to be successful (Kizilcec, Pérez-Sanagustín, & Maldonado, 2016; Littlejohn, Hood, Milligan, & Mustain, 2016). This means that MOOCs can only provide an effective learning environment for the small elite of persistent and high achieving current undergraduates who exhibit most self-regulation (Nicol & Macfarlane-Dick, 2006).

However, professionals are more likely to be self-regulated learners, and MOOCs can provide a high quality version of the typical course for professional development, i.e. the latest ideas and techniques on video, access to digital resources, and the engagement with other professionals, that is so important for them together. The real potential of MOOCs is not, therefore, in the direct provision of higher education to all learners, but in scaling up support to a much wider range of professionals.

In this the next section we explore the feasibility of two ways of using MOOCs for collaborative professional development. The first relates to teacher professional development (TPD).We examine case study data from four current TPD MOOCs that we designed and evaluated. Teachers, through their engagement with MOOCs, can then provide local access to high quality education for a wider range of learners, showing how MOOCs can contribute to meeting SDG4. The second is an exploration of the way MOOCs can be used as a form of large-scale public engagement in professional development in the health sector, focusing on MOOCs delivered by UCL and the London School of Hygiene and Tropical Medicine (LSHTM), thus contributing, potentially, to SDG3 on promoting health and wellbeing.

Teacher professional development on the large scale

Introduction

The UN's SDG4 sets the goal for universal basic education, one that fits with the mission and value statements of most universities in relation to their role in the world. Universities are responsible for educating the professionals who will provide that 9 years of basic education. The expansion of basic education over the last half century has been unprecedented, to the extent that most children now have access to basic education (World_Bank, 2018). Even so, global higher education is very far from meeting the extension to 9 years for the new goal. UNESCO reports the need for 69m more teachers by 2030 to meet the scale of the educational challenges across the world, and states that "For education to be transformative in support of the new sustainable development agenda, 'education as usual' will not suffice" (UNESCO, 2016, p. 160). We can only tackle this issue at present by considering an alternative to the current models for supporting the professional development of teachers.

In this section we explore the potential of MOOCs for supporting teachers in all sectors to collaborate on innovative digital methods that are designed to improve learning outcomes. We have analysed data for four current MOOCs provided by universities, all of which aimed to support teachers to use blended learning. These are:

- **ICTPEd**: ICT in Primary Education, on Coursera, for primary school teachers and policymakers.
- **PTET**: Progressing Technology Enhanced Teaching, on EU Schoolnet Academy, for school teachers.
- **BLE**: Blended Learning Essentials, on FutureLearn, for the vocational education sector.

- **PBL**: Blended Learning for Project-Based Learning, on Learning Cell (at Beijing Normal University), for school teachers.

These analyses explore the extent to which a teacher community collaborates through learning from each other in discussion, and through reviewing each other's practice.

Engaging professionals in learning from each other

MOOCs always offer a discussion environment, but their success appears to be dependent on the pedagogic design. If there is a specific topic for focused peer discussion, and not just an option to comment, then teachers are more likely to engage in that step. While early MOOCs generated only two to three per cent participation in forums, the ICTPEd teacher professional development MOOC used focused peer discussions and achieved significantly higher participation at 39 per cent (Laurillard, 2016), and an 81 per cent rating of 'usefulness' (Laurillard, 2014). The course had around 600 active participants from the DfID 'low-income countries' (Laurillard, 2015).

Similarly, the PTET MOOC for EU teachers had high participation. The post-course survey showed 90 per cent 'agree/strongly agree' that 'The forum discussions were useful for my learning'. In the PBL course 44 per cent of participants completed all the steps, which includes participating in discussions, and evaluated the discussion forums at 4/5 on a 1-5 scale. In the BLE MOOC, 21 per cent of participants in the final week generated nearly 2,000 comments in the discussions focused on specific topics in the video case studies and shared contributions. The post-course survey item 'Focused discussion questions' had an 83 per cent rating of liked/strongly liked. In interviews with participants after the course, participants explained that the discussions made them feel like they had company, creating a common space where *"people didn't seem to be worried about putting up their comments" (Participant 16.)*

The only negative comment related to the large numbers contributing to discussions.

Even in the best cases cited, less than half the active participants contribute to discussions. However, in all cases forum ratings are high in the post course survey, suggesting that teachers do derive high value from both the actual and vicarious experience of the debates among their peers. Further research is needed to ascertain the extent to which the teachers are learning from each other in these discussions. At this stage, we can show that the design of these courses is at least able to foster the valued peer discussion needed for collaborative knowledge building.

Peer reviewing of practice

Forum discussion is not sufficient for building knowledge from practice, however. It may succeed in "creating joint reference… as a platform for further exploration" (Crook, 1996: 225), but developing community knowledge requires a tougher process of peer review of each other's practice. We analysed the data from the TPD courses to explore the feasibility of this.

Platform data shows that teachers are willing to prepare and submit short pieces of work that typically require at least an hour of effort, and to collaborate in the review process, and discussion comments often show a clear intention to make use of the resources. The process elicits sufficient contributions, such as learning designs, for it to help with knowledge-building, e.g. 1300 for ICTPEd, >900 for BLE, 2500 for PBL. However, the review process must be carefully designed to allow and elicit critique - advice on improvement is much more highly valued by recipients than scores alone.

Surveys and activity evaluations showed that participants in all four courses who performed reviews rated the process of doing a peer review higher than receiving one – more is learned from reflecting on an alternative approach to the same task.

The idea of collaborating to build knowledge of effective teaching practices rests on the extent to which teachers value each other's ideas and feedback. We tested this in the PTET survey, where 72 per cent of respondents rated participants' submitted examples as useful/very useful, and 88 per cent rated the process overall as useful/very useful.

Both the large-scale quantitative data and the small-scale interview studies provide evidence of a teacher community able to discuss, review and learn from each other's practice, orchestrated by, but not wholly dependent on, the course team. These examples show that the format of a MOOC can be developed into a potentially powerful and valuable tool for a professional community to own and maintain its own process of community knowledge development. The next section will examine the possibility of extending this model to other disciplines by using MOOCs as a tool for public engagement.

Research impact through professional development

Introduction

Studies of MOOCs drawn from the health sector illustrate their potential as tools for public engagement in research findings, which also create access for professionals working in the more challenging global contexts. In recent years, the rise of the research impact agenda in universities has attracted critical discussion (Gunn & Mintrom, 2016; McCowan, 2018; Upton, Vallance, & Goddard, 2014). The challenges of measuring research impact, particularly that of research that falls outside of STEM subjects, and the fear that this may undermine some forms of academic inquiry, has led to calls for an emphasis on the *process* of knowledge exchange rather than its outcomes (Upton et al., 2014). We argue that MOOCs designed to engage practitioners in the field with the results of university research projects have a distinctive contribution to make to this debate. MOOCs can achieve a depth and breadth of dialogic engagement, substantially shifting the "linear relationship" of knowledge

transfer to genuine knowledge exchange (McCowan, 2018) and reflection-in-action (Schön, 1987).

MOOCs as professional development

Ebola in Context

In November 2014, LSHTM[2] fast-tracked the creation of their *Ebola in Context: Understanding Transmission, Response and Control*[3] MOOC in response to the 2014-16 Ebola epidemic. The *Ebola in Context* MOOC was created in 7 weeks and hosted on the FutureLearn platform. The course offered health professionals in the field a rigorous, multidisciplinary perspective on the principles of infectious disease transmission, the social context of the Ebola epidemic, treatment and control measures, and the challenges of implementation and innovation in an emergency. In three runs, >12,000 participants were active engaged. The top ten countries of origin for the participants included 5 countries with cases of Ebola, including >300 from Sierra Leone, thus reaching many of the target audience.

The *Ebola in Context* participants were atypical for FutureLearn in that, 69 per cent were health professionals, contrasting with the 13% average from that sector[4].

The rate of conversion from 'Learners' (those who start the course) to 'Active Learners' (who complete at least one step), was 84 per cent, contrasting with the FutureLearn average of 66 per cent.

Tn response to the urgent global demand the LSHTM MOOC created highly successful public engagement with their research, and engaged committed professional learners who could put that knowledge into action from >180 low- and middle-income countries (LMICs).

Global Blindness

A longer-term approach to evaluation has been adopted by another LSHTM MOOC, *Global Blindness: Planning and Managing Eye Care Services* (Parsley, S., Patel, D., Stroud, J., & Lynch, S., 2017) created to provide professional development to meet the global need for improved access to effective eye care.

The *Global Blindness* MOOC attracted far fewer initial learners than *Ebola in Context*[5], but a post-course survey attracted 139 responses, 94 per cent of whom were healthcare professionals, with 82 per cent living in LMICs. The results showed that 85 per cent could apply their learning at work, and many had gained career advantage from the MOOC. Critically, 70 per cent had re-used the course resources to guide proposal writing, and 65 per cent were guiding others about eye care, multiplying the impact of the MOOC.

Peri-Operative Medicine in Action

The UCL MOOC *Perioperative Medicine in Action* shows how the commitment of the participant and the value accorded to certification can combine to create a self-sustaining, university-practitioner knowledge exchange environment.

Perioperative medicine is an emerging, multidisciplinary approach, so the MOOC targets a range of health professionals, aiming to prevent deaths or prolonged complications following surgery. A distinguishing feature of the Peri-Operative Medicine in Action MOOC is its endorsement by the Royal College of Anaesthetists and the World Federation of Societies of Anaesthesiologists, which lend value to the Certificate of Achievement. 20 per cent of participants paid for the certificate, generating £94,000, compared to 7 per cent for *Global Blindness* participants, whose certificates have no such professional endorsement.

Perioperative Medicine in Action is therefore a financially sustainable MOOC as a vehicle for knowledge exchange. The income begins to cover both ongoing support and development costs.

Summary

The case studies from the health sector show that these forms of interactive and collaborative MOOCs are able to bring researchers and end-users, including those from LMICs, into a close, participative research model. It is a means of using an online intervention to bring the global to the local, as a more participative form of professional development and knowledge exchange.

A new model for professional development and research

When the scale of a problem is massive, we must look to solutions that can work on a massive scale. The MOOC platforms do that, and our analysis shows that high quality professional development courses are thus feasible on the large scale. They reach professional participants across the globe, including the Global South, as illustrated by all these courses, and in terms of effectiveness, both quantitative and qualitative data show that professionals recognize the value for their local beneficiaries.

Measuring the reach of MOOCs to participants' local groups is difficult. A single MOOC could achieve 10,000 active participants, given that in three runs of BLE there were over 35,000 active participants. Each participant could share their knowledge with their local group of, say, 25 learners. On these modest assumptions, therefore, the reach would extend to a quarter of a million beneficiaries, which is a substantial number. The arithmetic is simple; the practice happens, but its value is hard to verify. Consequently, research now focuses on the second-order effects of MOOC participation. Meanwhile, the projected estimate is

sufficiently large, with respect to the very large-scale ambitions for professional development, to provide the motivation for this.

The MOOC provides an alternative to the 'cascade model' that has been the typical format for the rapid and affordable training of professionals on the large scale, especially in education. It is hierarchical and uses experts to train a selected national group of professionals, such as teachers, who then transmit their learning to other regional groups, who transmit to local groups, sometimes across several levels. It tends to fail because of the loss of value in the transmission: the initial group does not always understand the material, (Ono et al, 2010), the top-down structure is too inflexible to respond to needs at the grassroots level (Suzuki, 2008), and the training does not always include the crucial participation, collaboration and ownership of the original form (Kennedy, 2005), summarized neatly as 'if you are too far away from the source you can easily avoid getting soaked' (McDevitt, 1998: 428).

Instead, we propose a 'local inclusion model' using MOOCs, because:

- the initial group is all professionals who need training, a MOOC being open to all;
- there is no loss of value because there are no intervening levels;
- the course value is direct; and
- participants are explicitly invited to discuss solutions and collaborate on adapting them to local conditions.

Thus all participants experience the full value of direct access to the guidance, and the participation, collaboration and ownership of the outputs.

If this model is to be fully effective, two key conditions must be fulfilled: equity and affordability. Our recent report defines equity in education in terms of digital access, language and culture, gender, geographic location, and the quality of the learning experience

itself. There are actionable solutions for policymakers, platform providers, universities, international agencies and national ministries who are willing to take on the challenge to make digital learning achieve equity in education on the large scale (Laurillard et al, 2018).

The report also argues that the model must be affordable for these stakeholders. One strand of this research has developed a new form of costing modeller for conventional, blended or online courses, including MOOCs (Kennedy et al, 2015). The approach enables providers to model teaching costs, learning benefits and fee income across multiple course iterations, and adjust costs and design elements to fit local conditions of affordability. If a sufficient percentage of participants in the Global North are motivated and able to pay for certificates (e.g. because they are endorsed to provide credit), it is conceivable that these participants could subsidise those less able to pay in the Global South. For the local inclusion model to be fully productive and affordable, policymakers and providers would need to "model and plan for income streams that will offset the true costs of online learning" (Laurillard et al., 2018, p. 23).

MOOCs have an interesting role in the context of universities providing a public good. Typically, they operate on an economies of scale model, where the development cost, of providing videos, reading materials, computer-assessed tests, peer discussion and peer review, is the same, no matter how many learners take part. In this case they are public goods (Marginson, 2018) because, unlike normal university courses, they are non-excludable (not confined to single buyers, as is clean air regulation) and non-rivalrous (consumable by any number without being depleted, as is knowledge). While participants are required to make an account with a MOOC provider, this is free, and potential de facto exclusions based on language are rapidly disappearing as MOOCs become available in multiple languages. But insofar as they attempt to offer learner support, such as highly labour-intensive tutor-assessed assignments, or individuals commenting in discussions, they attract commensurate costs that

would be unsustainable without charging, and for these elements, they become a private good.

MOOCs can offer an affordable public good by providing free or low-cost certified education to professionals on the large scale with personalized learning only in the form of peer collaboration. And as we have seen, the returns to the providers that are possible from the low-cost certificate suggest that financial sustainability could be feasible in some professional areas.

Conclusions

In this chapter we have set out the evidential basis for universities to plan a major role in transforming professional development. We have presented evidence of the willingness of teachers and health professionals to engage in this, to engage with and learn from each other, and to use and adapt what they learn within their own context. We have also shown evidence of knowledge exchange between researchers and their end-users through engagement with their findings in MOOCs.

MOOCs being massive and open, present a new opportunity to universities to tackle the immensely large-scale problem of equity in education. The global potential of MOOCs is not to widen access to undergraduate education, but to professional education. Using them to orchestrate knowledge exchange and professional community knowledge development would enable universities to contribute significantly to the global challenges facing education.

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