# SCALING A MODEL OF TEACHER PROFESSIONAL LEARNING – TO MOOC OR NOT TO MOOC?

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## ABSTRACT

This paper describes an innovative model of teacher professional learning that has evolved over a decade. Working in a range of different school contexts, in conjunction with an ongoing engagement with the research literature, has enabled the development over three phases of a robust, yet, flexible framework that meets teachers' expressed needs. At the same time, the framework helps to shift their pedagogical orientation, as the learning design supports school-focused, job-embedded teacher professional learning, which challenges more traditional instructional environments by infusing digital technologies and other elements of 21st century skills into teaching and learning. Building on this experience the paper then reports the most recent phase of designing and developing a Massive Open Online Course (MOOC), which could potentially enable the massive scaling up of access to this already validated model of teacher professional learning. Finally, we discuss the importance of maintaining key elements and signature pedagogies in the design of MOOCs for teacher professional learning, and conclude with early lessons from this latest work in progress.

## KEYWORDS

Teacher education, 21st century skills, MOOCs, peer learning, learning design, ICT

## 1. INTRODUCTION

Today's world is rapidly changing. We live in a period of major technological change where a number of grand challenges such as climate change, unsustainable population growth and the future of work require critical thinking and creative solutions. More than ever, we need to ensure that all students have the knowledge, skills, abilities and competencies to be successful in the 21st century. A range of "21st century skills" (often referred to as "Key Skills" or "Key Competencies", (e.g. ETA, 2010; OECD, 2005), have been identified as necessary to prepare students to live, work and thrive in a digital society. They include skills such as critical thinking and problem-solving, communication, collaboration, self-regulation and information management (e.g. Binkley et al., 2012). The ability to use digital technology effectively and reflectively is identified as a key competence in these initiatives, each of which stresses the potential of technology to transform the learning experiences of students by helping them become engaged thinkers, global citizens, and active learners in collaborative, social learning environments (Butler & Leahy, 2015).

Teachers in today's classroom must not only be prepared to use technology; they must also know how to use technology to support student learning. According to UNESCO (2008), these have become "integral skills in every teacher's professional repertoire" (p.1). The importance of developing these skills cannot be emphasised enough, especially when one considers that teacher quality, not funding, has been found to be the determinant factor among conditions that support the performance of the world's best education systems (Barber & Mourshed, 2007). How then do we go about ensuring that teachers have these skills? We know that teaching and learning is complex. Therefore, it should not be a surprise that efforts to integrate new digital technologies add to this complexity. In addition, we know that the introduction of new technology into a learning environment does not by itself lead to changes in learning outcomes (Dynarski et al., 2007). Nor does it mean that educators will meaningfully integrate technology into teaching and learning (e.g. Russell et al., 2003) or develop innovative teaching practices (Fullan & Langworthy, 2014). Instead, past experience has taught us that new tools can easily be used to reinforce or perpetuate traditional teaching methods (e.g.

Law & Chow, 2008). Moreover, what the research shows is that how technology is used determines whether or not its use affects learning outcomes (e.g. Higgins et al., 2012).

There is growing consensus among education leaders and researchers worldwide that both teaching and learning need to change to help students develop the skills they need to succeed in the complex, globally connected world of the 21st century (e.g. Ananiadou & Claro, 2009). Specific goals for 21st century teaching and learning are now commonplace and while these goals vary across countries, common themes include problem-solving, teamwork, and the use of technology to support more impactful learning. Despite this, teachers rarely have access to specific guidance or support on how to make 21st century goals come to fruition in the classroom. There is a significant gap between the goals for 21st century teaching and learning and well-designed teacher professional learning programmes to develop these skills. Faced with this reality, the challenge is to design professional learning experiences for teachers that enable them, in turn, to design learning activities that enable their students develop the dispositions, skills and competencies required to live and thrive in the 21st century.

## 2. DEVELOPMENT OF A TEACHER PROFESSIONAL LEARNING SCALABLE MODEL

In this paper and against this backdrop, we report the development of a scalable model of teacher professional learning in Ireland, which has been developed and has matured across three phases, over nearly a decade. We begin by outlining how this approach was developed in a single secondary school engaged in a global project in Phase 1 (2007–2010) and then how building on the success of Phase 1, the initiative expanded to district level in Phase 2 to include eight more schools (2009-2013). Across both phases, the programme of professional learning developed was school-focused, job-embedded and directly related to the teachers' experiences along with their stated needs and interests. In response to an expressed desire among school leaders and teachers alike, it was also directly linked to a university postgraduate accreditation process (Butler & Leahy, 2010; 2011; 2015). Finally, Phase 3 concerned the design and development of a MOOC which has the capacity to engage teachers globally (2014-to date).

### 2.1 Phase 1 - Designing a Teacher Professional Learning Framework

The 'Innovative Schools Programme' (ISP) was a Microsoft Partners in Learning initiative that sought to support teachers around the world as they transformed traditional schools into providers of innovative learning experiences, that prepare students for the 21st century. This initiative was implemented in different ways across 12 pilot schools worldwide, as each school was encouraged to select reform goals that were appropriate for its local and national educational context. In Ireland, the focus was placed on the integration of digital technologies into teaching and learning in the secondary sector. The main objective was to design a framework for the professional learning of teachers in a secondary school. This approach was considered particularly important in Ireland because rigid state standards and a traditional exam-based system of education at secondary level constrain teachers' ability to change their instructional practices. It leaves them with little time or flexibility to introduce new ideas or practices. The school, the ISP program manager in Ireland and the national evaluators (Butler & Leahy, 2010; 2011; 2015) saw the ISP as a means to make a very rigid system more flexible through the use of digital tools.

Prior to the ISP, training had been provided to teachers in the school in the use of a variety of applications and a range of hardware. There was also a strong culture of peer support within the school. However, the training tended to be "technocentric" as the focus was on the "technology" and the acquisition of skills and the development of products for teaching rather than reflection on possible new pedagogical practices.

As national evaluators, Butler & Leahy realised the need not only to work closely with teachers and school management to shift this focus but also to concentrate on the teachers' beliefs and values as the starting point. This was because research evidence has repeatedly identified a teacher's pedagogical orientation as a dominant factor in how they use ICT in their classroom (e.g.; Law et al., 2008; Shear et al., 2011). Research has also demonstrated that professional development programmes are most effective when they are embedded into teachers' professional lives and communities within the school (Darling-Hammond et al., 2009), are focused explicitly on local goals for student learning (e.g. Darling-Hammond, 1993), and

grounded in collective discussions of classroom practice (Warren Little, 2003). To this end, a key feature of the professional learning programme was that it was both directly related to the teachers' stated needs and experiences and anchored in the meaningful context of their own classroom practices. Previous experience in developing a model of professional learning had led to the realisation that in order to change classroom practice teachers need to ask questions about their existing classroom practices (Butler, 2004). To do this, it was critical that the teachers in the school were challenged to question their practice. The Learning Activity/Student Work (LASW) framework developed by Stanford Research Institute as part of the ISP (Shear et al., 2009) provided this context. The framework enabled the teachers to design learning activities in which they embedded 21st century learning principles, develop the meta-language used to describe such learning environments as well as reflect on their teaching and the assignments they set their students (Butler & Leahy, 2010; 2011; 2015). Finally, as requested the programme was directly linked to a university postgraduate accreditation process.

## 2.2 Phase 2 – Evolution of the Peer Coaching Model

Observing the changing nature and more innovative practices during Phase 1 that occurred as a result of engagement in the professional learning programme, management requested that the programme be expanded to district level. In consultation with Butler & Leahy, they decided to invest funding into the professional learning of a group of teachers in schools across the district. It was perceived that these teachers would become peer coaches and promote the creative integration and use of digital technologies in teaching and learning among teachers at their schools. The target group identified to become peer coaches were the ICT coordinators from schools across the district. Traditionally, the role of ICT coordinator was associated with ensuring that hardware was in working order or at best supporting the development of teachers' technical ICT skills. However, in agreement with district management, this role was redefined whereby ICT coordinators were now expected to support innovative and emerging new pedagogies and technologies to facilitate student learning and the development of twenty-first century skills. Management also requested that formal accreditation would continue to be a feature of the programme. In response, the Digital Learning Peer Coaching (DLPC) programme was developed with 12 teachers participating over two school years (2009-2011).

## 2.3 Impact of the Professional Learning Model

Across Phase 1 and 2, teachers, school leaders and management initially tended to view digital technologies as tools to support traditional practice. However, through participation in the programme, their understanding shifted and they began to perceive digital technologies as tools that facilitate more progressive classroom practices and the development of their students' 21st century skills. Evidence of this change and enhanced quality of education is found in the national evaluation reports of the ISP (Butler & Leahy, 2008, 2009) as well through analysis of the coursework and final dissertations produced by teachers participating in the postgraduate diploma (Butler & Leahy, 2015). Together, they demonstrate that the overriding impact of the programme was to move teachers "out of their comfort zones" (Butler & Leahy, 2015). Traditional assumptions, beliefs and classroom practices of all the participating teachers, coaches and coaching partners were challenged and they began to focus on more innovative approaches to student learning with increased integration of digital technology in the classroom. This was evident by the emergence of the following trends in classroom practices:

- Student-centered learning
- Project based learning rather than discrete lesson plans
- Students working collaboratively in groups rather than individual learning
- Focus on learning not on subject "content"
- Awareness of / designing lessons with opportunities for students to develop 21st century skills
- Increase in teacher confidence to use a greater range of pedagogical strategies / digital technologies
- Collaboration across and between subject departments / ripple effect

The shift in pedagogical orientation along with increased use of digital technologies in learning and teaching had a positive impact on student learning, resulting in learners:

- taking control of their own learning
- having greater ownership of the learning activities
- demonstrating more engagement / participation
- increased collaboration
- being active rather than passive in their learning
- taking on new leadership roles

This change is encapsulated by a peer coach as follows:

> I really believe that during this process we have analysed these 21$^{st}$ century skills, probed how we can bring them to the fore in our learners and prove that they possess these skills while using ICT to make learning more interactive, exciting, independent and engaging. (Butler & Leahy, 2015)

From this, it is apparent that the model of professional learning resulted in a shift in the pedagogical orientation of the teachers who were involved in the programme. It enabled the participating teachers to design learning environments which were more student-led and characterised by the use of a range of digital technologies supporting an enquiry process that demanded the use of essential skills such as knowledge construction, problem-solving and innovation, self-regulation, skilled communication and collaboration. This is a significant move away from the narrow exam drive focus towards a knowledge deepening approach (UNESCO, 2008, 2011).

## 2.4 Problems of Scalability

Although the developments and findings outlined above were encouraging, the issue of scalability has become increasingly problematic. Policy decisions in relation to the development of a range of "21st century skills" (NCCA, 2009) as well as the ability and the need to use digital technology effectively and reflectively in Irish schools, has led to ongoing demands to extend the model of professional development. In particular, the launch of the Digital Strategy for Schools (DES, 2015) identifies "a need to ensure that ALL teachers are equipped with the knowledge, skills and confidence to integrate ICT into their practice" (p. 7). There has also been ongoing international demand to facilitate workshops, many of which could not be sustained (e.g. Finnish Board of Education, Microsoft's Global Educator events, Jordan's Teachers' Institute). As a way of addressing this problem of scalability, the possibility of using a MOOC format was considered.

## 2.5 Phase 3 – Scaling the Model of Professional Development

The research literature to date suggests that MOOCs are most appropriate for those learners who already hold an undergraduate college degree or higher (e.g. Ebben & Murphy, 2014). While MOOC completion rates are low, prior level of schooling is considered a predictor of achievement (Greene, Oswald, and Pomerantz, 2015); thus suggesting that teachers completing a MOOC for professional development might be more likely to complete it rather than other participants (Hodges et. al., 2016). In fact, Lauillard (2016) considers the use a MOOC as a medium for the continuing professional development of teachers as "a perfect fit" (p. 7). Therefore, coupled with the growing number of open solutions targeting schools (e.g. ICEF Monitor, 2016; Vivian et. al, 2014), it was a logical step to investigate the use of a MOOC to scale the model of teacher professional learning we had developed to date.

## 3. WHY A MOOC?

Although there are issues around completion and accreditation, MOOCs are now recognised as a valid form of professional learning in a number of professions. They have the potential to attract large numbers of learners, particularly highly qualified professionals to participate in free education programmes (Laurillard, 2016).

MOOCs can be defined as "typically involving structured and sequenced teacher-led activities (e.g. videos, readings, problem-sets) coupled with online assessments and usually some venue for student interactions such as a discussion forum" (Greene et al., 2015, p.927). Participants can thus interact with the content at their own pace over a period of time (Jobe, Ostlund and Svensson, 2014). When accessed in this way, MOOCS are referred to as xMOOCs. In contrast, MOOCs which place more emphasis on connecting with learners through blogs and forums rather than on structured resources are referred to cMOOCs (McGreal et al., 2013 in Jobe, Ostlund and Svensson, 2014). They are designed so that learners can learn "through practice (construction and responding to feedback), discussion (comments and conversations) and production (negotiating an output for evaluation by others), making it a complex and valuable learning process" (Laurillard, 2016; p. 16). There is a growing interest in how MOOCs can support teacher professional learning (e.g. Hodges, Lowenthal and Grant, 2016). In this regard, the xMOOC format may work well at scale by providing a mix of presentations such as videos and digital resources, automated assessment, peer-assessed assignments and peer discussions (Conole, 2013 in Laurillard, 2016). Thus, a big part of developing an xMOOC is the design and development of such assets (i.e. video, presentations, discussion topics etc.), as ultimately participants will interact with these during the course. However, the likelihood is that these assets may not provide sufficient opportunities for teachers to interact in a meaningful way with the content or with other learners. The challenge is therefore to design learning experiences that support large numbers of teachers to engage in a model of co-learning which as stated by Avalos, 2011 involves:

> networking and interchanges among schools and situations and is strengthened in formalised experiences such as courses and workshops that introduce peer coaching or support collaboration and joint projects ...the lesson learned is that teachers naturally talk to each other, and that such talk can take on an educational purpose. (Laurillard, 2016; p.3)

Cognisant of the research and taking into consideration our experiences in Phase 1 and 2, we strove to design a MOOC that could reach large numbers but also provide opportunities for teachers to learn through practice, discussion and production (Laurillard, 2016). In this sense, we wanted teachers both to try out ideas in their classrooms and report back on their experience. We wanted to promote critical reflection and discussion as well as providing opportunities for teachers to share ideas and resources. Incorporating these elements would we believed result in scaling the model of teacher professional learning we had developed to date, that is, contextualised and meaningfully rooted in classroom practice. We are critically aware that that a community of practice needs to be built up around a MOOC, as against individuals just working through things on their own.

### 3.1 Towards Building a MOOC

After a period of research and negotiation, funding was secured from Microsoft to design a MOOC. The aim of the MOOC, which we entitled the 21CLD MOOC, was to scale the model of professional learning developed in Phase 1 and 2. It would thus enable teachers to examine and change their own classroom practices, as they relate to innovative uses of digital technologies to support their own and their students' learning and the development of 21st century skills. Working with partners from the wider university and in the SME sector, we accordingly began the design process.

In keeping with Phase 1 and 2, a central feature underpinning the MOOC design was the tenet that when teachers' pedagogical orientations are driven by understandings of 21st century learning, they take on a more facilitative role, provide student-centred guidance and feedback, and engage more frequently in exploratory and team-building activities with students (Shear et al., 2011). Findings in Phase 1 and 2 were that the changes observed in the teachers' pedagogical orientation and the emergence of a culture of self-evaluation

among the teachers was directly attributed to the use of the Learning Activity/Student Work (LASW) framework (Shear et al., 2009) which was introduced as part of the coursework. Comprising of a set of rubrics that describe key dimensions for innovative teaching and learning: knowledge construction, collaboration, problem solving and innovation, self-regulation, skilled communication and the use of ICT for learning; the LASW framework enabled the participating teachers to design learning environments which were more student led and characterised by the use of a range of digital technologies supporting an enquiry process. Teachers' claimed the framework had both increased their understandings of the principles underpinning 21st Century learning and also led them to reflect on their own understandings and assumptions about the learning environments they designed for their students.

> I look at the assignments I give the students in a different way…. My objectives are now to improve student engagement and understanding. I want the students both to exercise logical and creative thinking and at the same time gain 21st century skills such as problem-solving, collaboration and self-evaluation. (Butler & Leahy, 2015, p. 341)

To this end, rooted in the LASW Framework (now called 21CLD), we designed an eight-module, self-directed course to be a core component of the MOOC design. These modules explore what learning looks like in the 21st century and how innovative teaching practices can support student learning to develop the key 21st skills of collaboration, knowledge construction, self-regulation, problem-solving and innovation, skilled communication, and the use of ICT for learning. As well as defining, explaining and illustrating each of the skills, an integral part of each module is an 'in action' video in which teachers from across the world showcase how they have embedded a specific skill in their classrooms. Each of eight teachers from countries such as Finland, Canada, South Africa and Australia designed extended learning units for their students which focus on the development of 21st century skills while also embedding the use of a range of digital technologies. As well as illustrating a particular skill in action, these videos are also intended to be the focus of discussions in which participant teachers analyse and reflect on the learning observed in each classroom. Teachers are also asked to share ideas as to how they could design learning activities for their own classrooms, which incorporate the development of 21st century skills.

While the modules we developed provided the content for a MOOC that could support the process of self-reflection on classroom practice, we face two key challenges in the implementation of the 21CLD MOOC. First we are concerned about how to maintain focus on the job-embedded, needs driven nature of the original model of professional learning. Cognisant of the reality of what works in one school does not necessarily work in another, in Phase 1 & 2 we had provided opportunities for teachers to debate and contextualise how to design learning activities for students which embedded the use of digital technologies as well as the development of 21st century skills.

> But, to get people to think about assignments, project based learning…to open people's minds, and the reason why it was so good from the professional learning point of view was because all the different subject areas had something different to bring to the table… people realised that although they see themselves as teachers of a particular subject, they're not really. That we're all part of the one group, and that we're all basically should be aiming towards this 21st Century education providing that for our students, as opposed to just teaching English, Irish, Maths or whatever it happens to be. (Butler & Leahy, 2015, p.330)

We had also provided the structure to enable strong collaboration:

> It afforded me the opportunity to engage with my peers in a very meaningful way. We had never engaged in deep discussion on the teaching and learning of our subject content or on the pressing need to update our methodologies and perceptions…. (Butler & Leahy, 2015, p.342)

The second challenge we face in the implementation of the 21CLD MOOC, is therefore how to recreate the collaborative nature of peer-coaching and develop the communities of practice that can sustain the culture of self-evaluation which occurred in Phase 1 & 2. In an effort to address these challenges, we have built into the design of each module some opportunities for "more collaborative and constructivist engagement with teachers" (Laurillard, 2016, p.3). For example, with the use of forums, rather than the typical MOOC forum format which tend to be used for question-and-answer (Hollands & Tirthali, 2014), we have framed focused questions related to the design of learning activities to promote what Laurillard (2016) refers to as

"co-learning". However, for this co-learning to be meaningful we are aware that the forum discussions will need to be moderated and supported by other means such as synchronous "live" sessions as well as working online asynchronously. In addition, and in keeping with "the cMOOCs focus on community building, social interaction [and] peer review" (Jobe et al., 2014, p.1581), we want participants to be able to work in peer groups, sharing experiences, ideas and expertise. This also aligns with our job embedded approach that recognises the value of the experience and expertise that teachers can offer each other (Butler & Leahy, 2015).

Finally, the notion of a MOOC is constantly evolving. It has recently been claimed that a mandatory design principle for a MOOC to be successful as a form of professional teacher development is that it offers a certificate/digital badge that clearly recognizes and validates the accomplishments of a learner. Indeed, a preferred design element in a massive course would even be university accreditation (Jobe et al., 2014, p.1583) as this would address the issue regarding the acceptance of accomplishments by employers. Some (see Bang et al, 2016) are proposing that layers be built on top of existing MOOCs so that different audiences can have different experiences. Using this concept and incorporating it with our own experiences of designing the professional learning model in Phases 1 & 2 we have envisioned how a series of layers could be built around the 21CLD MOOC assets (see Figure 1).
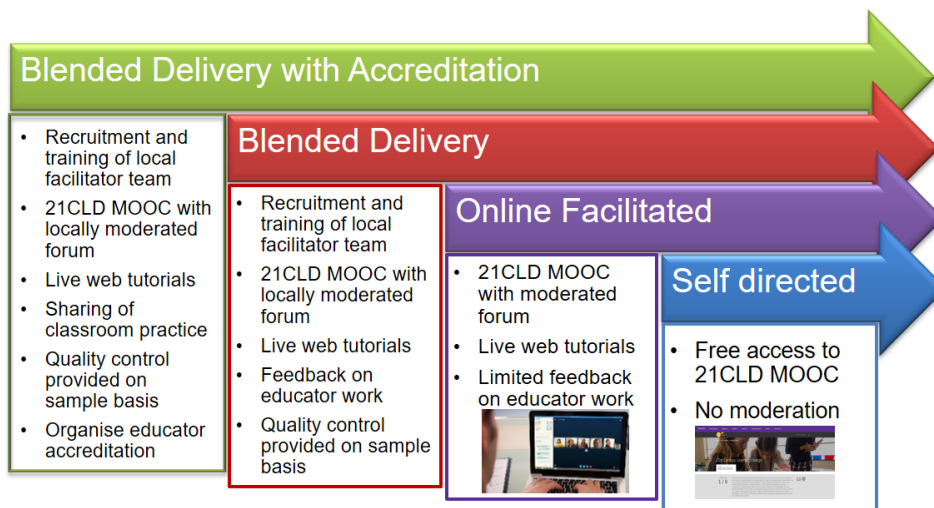


Figure 1. Possible ways that the 21CLD MOOC can be developed

Constructing a series of layers will ensure that teachers can interact with the MOOC assets in a variety of ways, ranging from self-study to a blended accredited model and this will very much depend on what type of learning experience they wish to have. To this end, we are currently working with several potential partners to build a range of social structures and supports to ensure the scalability of the 21CLD MOOC model by embedding it within the existing structures across the education landscape in Ireland. In addition, discussions are already advanced within the university to extend the previously accredited face to face model to the 21CLD MOOC structure.

# 4. CONCLUSIONS

Currently, any teacher can access the MOOC assets developed for the eight modules of the 21CLD course on the Microsoft Educator Platform and over 10,500 have done so in the five months since its launch in February 2016. However, the content has not, as yet, been designed or hosted on a MOOC platform. The next phase of development is to take these assets and to relocate them on a MOOC platform where we can build learner experiences that relate to the layers outlined in Figure 1. Ultimately, we want to design a MOOC learning experience that resembles the deep professional learning experiences observed in Phase 1 and 2, so that we "create equitable, dynamic, accountable and sustainable learner-centred digital learning ecosystems" (Incheon Declaration Education 2030, 2015). Among the greatest challenges going forward will

be to design the social supports within the MOOC structure to sustain the collaboration, dialogue and ongoing reflection that is necessary for the changes in pedagogical orientation and classroom practices (which were observed across phases 1 and 2). In this sense, although the 21CLD resources are now available to a world-wide audience, we have still to develop ways that the school-embedded, job-focused model of teacher professional learning can be scaled effectively so that the teacher professional learning experience is contextualised and rooted in classroom practice. The need for this transformation from simple "resources" (or artefacts) into a dynamic, ongoing "process" is the next challenge in the development of this MOOC to support a scalable and sustainable model of teacher professional learning.

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