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Designing Continuing Professional Development MOOCs to promote the adoption of OER and OEP

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Abstract

There is growing interest in the adoption of open educational resources (OER) and open educational practices (OEP) in a variety of contexts. Continuing professional development (CPD) among practitioners in the effective adoption of OER and OEP is critical in this scenario. Massive open online courses (MOOCs), which also grew as part of the open education movement, provide a feasible means for this purpose. MOOCs are considered a 'disruptive innovation' in making free and open learning opportunities accessible to large numbers. Yet, the design of an effective massive online course that is as robust as a great online course with smaller student numbers where good principles of teaching and learning are maintained, is very challenging. Most contemporary MOOCs tend to have a content-driven focus of knowledge transmission, deviating from its original focus of knowledge generation. With the intention of providing learning experiences to promote learner engagement with OER, rather than presenting content about OER, we designed four CPD MOOCs to support the integration of OER and adoption OEP by practitioners based on a scenario-based learning (SBL) approach. This paper presents the analysis and design phases of this process, discussing the challenges faced and innovative strategies adopted in our pursuit to answer the question, "How best to design effective MOOCs on OER and OEP for continuing professional development of practitioners?"

Keywords: MOOC design; Continuing Professional Development; Open Educational Resources; Open Educational Practices; Scenario-based Learning; Learning Experience Design

Introduction

In order to develop capacity among educators in the integration of OER in their teaching practices, the Open University of Sri Lanka (OUSL) implemented a professional development (PD) course on OER-based e-Learning (OEReL), with the support of the Commonwealth Educational Media Centre for Asia (CEMCA). This fully online course of 24 weeks comprised five modules adapted from a core set of modules in a course on OER-based e-Learning that was developed by CEMCA, in collaboration with the Wawasan Open University, Malaysia, as part of its institutional capacity building programme to promote use of OER (CEMCA, 2014). At the successful completion of its implementation, there was an imperative for the continuation of this course beyond OUSL to other Universities and higher educational institutions in Sri Lanka, and in the region, by re-designing it in the form of a MOOC (Massive Open Online Course) for continuing professional development (CPD) of practitioners.

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As revealed by research conducted in relation to the OEReL course, (see Karunanayaka, Naidu, Rajendra & Ratnayake, 2015, 2017; Karunanayaka, Rajendra, Ratnayake & Naidu, 2016), it had much strength as a PD online course for educators on OER-based eLearning. However, a common issue faced by the participants as full-time academics, was the difficulty to engage in and complete all required learning and assessment tasks within the stipulated time-frames. Due to this, many participants dropped out during the course, and the completion rate of the full course was only 29%. In order to extend the existing course to a wider audience, while addressing these issues, it was decided to substantially re-design the OEReL course as four independent CPD MOOCs on OER and OEP, each of a shorter duration.

While the concept of MOOCs has gained significant attention in making free and open learning opportunities accessible to large numbers, the real challenge lies in the design of an effective massive online course that is as robust as a great online course with smaller student numbers where good principles of teaching and learning are maintained. To deal with this challenge, a design-based research (DBR) approach is adopted in this project, which comprises an iterative process of analysis, design, development, and implementation while testing theory and producing design principles (Reeves, 2006). This paper reports on the analysis and design phases of this DBR process, during which the learning experience design of the CPD MOOCs took place, adopting innovative theoretical constructs, and using a scenario-based learning (SBL) approach.

Review of Literature

MOOCs grew out of an interest in open and flexible learning. Since its emergence in 2008, the MOOC phenomenon has gained rapid attention and wide recognition as a promising educational innovation, and is considered a model of free, open and life-long learning (Anderson, 2013; Bates, 2015; Daniel, 2012; Downes, 2012). Trends in MOOC development indicates significant changes in MOOC types in relation to their pedagogical designs, from “c” (connectivist) MOOCs to “x” (extended) MOOCs and further to various hybrid/dual layer MOOCs (Bozkurt, Akgün-Özbek & Zawacki-Ritcher, 2017; Liyanagunewardena, Adams & Williams, 2013).

The first generation of cMOOCs supported a connectivist theory of learning that viewed knowledge as distributed and learning as a social process, focusing on ‘knowledge creation and generation’, while the second generation of xMOOCs focused on ‘knowledge duplication’ (Siemens, 2014). Key design principles for cMOOCs are: autonomy of the learner- in terms of learners choosing what content or skills they wish to learn; diversity- in terms of the tools, participants and content; interactivity- in terms of co-operative learning and communication; and openness- in terms of access, content, activities and assessment (Bates, 2014). In contrast, common design features of xMOOCs comprise transmitting information through video lectures, computer-marked assessments and peer assessments, automation of all key transactions, and no or very light discussion moderation (Bates, 2015).

The current dominance of xMOOCs in education indicates a transformation of MOOCs from its original intention of knowledge sharing among networked learners, back to the conventional transmission of information from an expert to novices. This implies a deviation in the purpose of MOOCs from a humanitarian motive to a more business-oriented motive (Bozkurt et al., 2017; Yuan & Powell, 2013). This change of focus of MOOCs from a ‘distributed knowledge network’ to a ‘hub and spoke model’ of learning (Siemens, 2012) raises concerns about the real purpose of MOOCs. However, it is argued that this c/x MOOC binary is no longer representative or useful (Bayne & Ross, 2014), and that the design of MOOCs is evolving with all kinds of variations (Bates, 2015).

If the main purpose of a MOOC is to ensure meeting learner needs and support learners achieve the intended learning outcomes, such course design essentially requires application of sound principles and practices of online teaching and learning.

The four key dimensions of MOOCs– Massive, Open, Online, Course - implies their main characteristics and required design features. Foremost, a MOOC is a large 'online course'. Its 'openness' element is not only about cost and access, but also about the flexibility in choices of content, activities, assessments and interactions by learners (Bates, 2014). While the 'massiveness' of these courses is often interpreted only in terms of the large student numbers enrolled, other dimensions of massiveness such as diversity among learners and their interconnections are just as significant. This complex nature of MOOCs essentially requires making critical pedagogical decisions in the design of MOOCs. However, despite increasing number of MOOCs, many such initiatives lack the expected rigor of a full course, and face various pedagogical challenges. Most contemporary MOOCs exhibit models of conventional lecture-based practices, disregarding widely known and sound principles of online learning (Naidu, 2015).

Given the expectation of MOOC learner characteristics such as autonomous, independent, self-motivated, and self-directed, MOOCs are ideal for providing higher education opportunities. MOOCs help to democratize higher education, with a preference towards a continuing education model (Evans & Myrick, 2015). MOOCs have a vast potential to support CPD and thus transform professional practices, provided the learning environments are designed in appropriate ways (Laurillard, 2014; Littlejohn & Milligan, 2015; Pickering & Swinnerton, 2017). Pedagogical design of CPD MOOCs thus requires crucial attention, intensely supported with theory of learning, while more creative and open-minded approaches are desirable (Bayne & Ross, 2014; Laurillard, 2014).

Conceptual Framework

The adoption of OER and OEP requires an understanding of the concepts, and skills in finding, identifying, and creating OER, as well as how best to integrate OER to support the teaching-learning process. This requires practitioners to move beyond a mere focus on access to OER, and engage in various scholarly practices of openness, resulting in OEP which are participatory, collaborative and innovative in nature (Andrade et al., 2011; Ehlers, 2011; Beetham, Falconer, McGill & Littlejohn, 2012).

A Scenario-based approach to Learning (SBL) which models situated cognition (Brown, Collins & Duguid, 1989) is adopted in this project to provide the conceptual framework for the design of the CPD MOOCs on OER and OEP. This approach is grounded in constructivist pedagogy (Jonassen, Peck & Wilson, 1999) where learners are placed in authentic real world learning scenarios that provide the context and scaffolding for all learning activities (Naidu, Menon, Gunewardena, Lekamge & Karunanayaka, 2007).

The SBL approach contains three basic attributes: A Learning Scenario – where learners are situated in authentic learning scenarios; Learning Activities – where learners assume key roles, and face various challenges; and Assessment Tasks – where learners demonstrate developed competencies, and enable teachers to assess their achievement of the intended learning outcomes. The development of SBL seeks to promote the design of effective, efficient, engaging learning experiences based on innovative pedagogical models, and supported with OER (Naidu & Karunanayaka, 2014). Several theoretical guidelines based on first principles of instruction (Merrill, 2002) and good practices of online learning (Anderson, 2008) also provided useful insights in the design process of the CPD MOOCs.

Methodology

The design and development of these CPD MOOCs adopted a design-based research (DBR) approach. DBR is a systematic and flexible methodology aimed at improving educational practices through an iterative process of analysis, design, development, and implementation. It therefore serves as a useful approach where researchers function as designers, to design solutions/strategies, in collaboration with the practitioners, in order to improve their educational practices in real life situations.

The DBR process includes four phases: analysis of existing levels of practices by researchers and practitioners; designing, developing and implementing solutions as appropriate; testing and refining solutions in practice; and reflection by researchers and practitioners on authentic problems to produce design principles and enhance solution implementation (Reeves, 2006). This paper focuses on the analysis and design phases of the DBR process, during which the learning experience design of the CPD MOOCs occurred during a series of interactive course design workshops conducted at the OUSL.

At a time when ICT-integrated teaching and learning is gaining wider popularity within the education systems, and with the growing need for raising awareness on the potentials of OER and promoting OEP among educators, the OUSL has embarked on this novel venture to develop CPD MOOCs to support the adoption of OER and OEP by practitioners. The course design team engaged in a sequence of systematic and carefully structured activities, keeping in line with the appropriate theoretical constructs and the conceptual framework adopted.

Research Questions

Based on the broad key research question, “How best to design an effective CPD MOOC on OER and OEP?” the following sub-research questions guided this inquiry.

1. How innovative theoretical constructs can be adopted in the design of CPD MOOCs on OER and OEP?
2. What challenges were faced in the design of learning experiences of the CPD MOOCs on OER and OEP?
3. How were these challenges met and overcome?

Participants

The learning experience design process of the CPD MOOCs took place with the participation of eleven members in the course team, comprising four researchers and seven resource persons, who are practitioners in the higher education sector with significant professional experience. Their interest and commitment in promoting open, online and flexible learning and teaching was a common characteristic which motivated their voluntary participation and engagement in this novel endeavor at OUSL.

Process

Stage 1 of the DBR approach commenced with an analysis of the problem and existing practices, by researchers and practitioners in collaboration. The team engaged in reviewing the modules of the existing OEReL course and discussing at length, the design strategies to be adopted in the CPD MOOCs, based on their experiences and good principles of online learning.

Next, in stage 2 of the DBR approach, development of solutions to address the key problem "How best to design an effective CPD MOOC on OER and OEP?" occurred, informed by existing design principles and technological innovations. Here, the team engaged in a highly challenging and dynamic process of designing efficient, effective and engaging online learning experiences in the four CPD MOOCs, in accordance with the SBL pedagogical approach, supported with relevant theoretical constructs.

Collection and analysis of data

Throughout the course design process, a variety of data was collected using several methods - concept mapping, written self-reflections, focus group discussions, and analysis of the designed artifacts.

Concept mapping was used as a strategy to visualize the concept formation by organizing and representing relationships between them (Novak & Cañas, 2007), which also helped in planning the structure of the CPD MOOCs. Three versions of concept maps were created- individual concept maps of team members; two small group concept maps combining individual ideas and a final group concept map merging all agreed design features. Further, the members engaged in writing self-reflections at various stages of the process. Reflective writing was guided by answering three questions- 'What?' 'So what?' and 'Now what?' (Rolfe, Freshwater & Jasper, 2001). In addition, focus group discussions among participants were held at the interactive workshops.

During these activities, the learning outcomes and key content areas were identified with the constructive alignment of all, and the course team arrived at consensus in the specific design features to be adopted, considering the needs and purposes of the target group. These resulted in several versions of various artifacts such as course maps, learning scenarios, learning activities, assessment rubrics, learner support documents, which demonstrated the conceptual development during the design process, in line with the guiding principles of teaching and learning.

The content analysis of concept maps, self-reflections, focus group discussion transcripts and designed artifacts reveal how innovative theoretical constructs were adopted in the CPD MOOC design, what challenges were faced during the process and how those were overcome by the participants.

Results and Discussion

How innovative theoretical constructs can be adopted in the design of CPD MOOCs on OER and OEP?

The key focus during the analysis stage was understanding the purpose of a CPD MOOC, and conceptualising the specific requirements, accordingly. The concept map presented in Figure 1 illustrates a summary of the conceptualized overall plan of the CPD MOOCs.

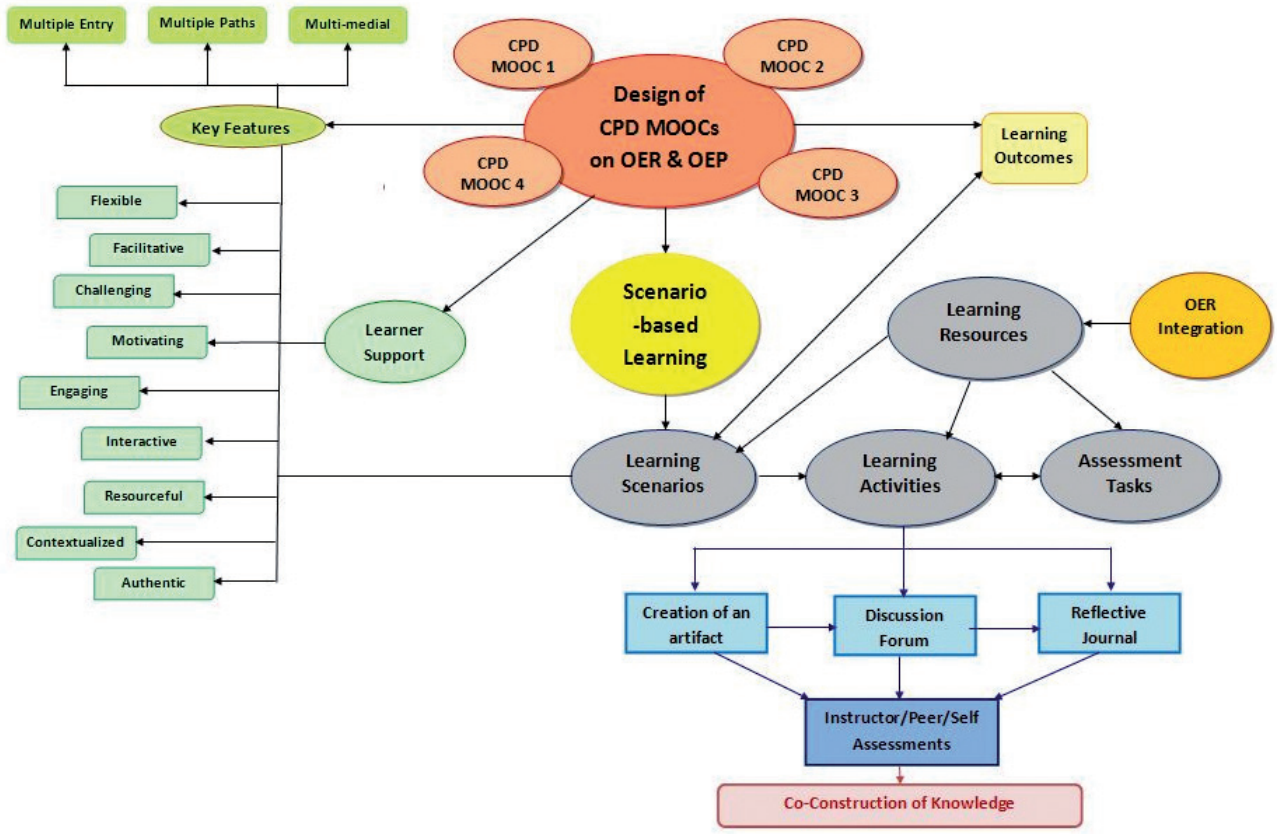

Figure 1: A concept map illustrating the conceptualization of the CPD MOOCs

Revisiting the existing OEReL course and based on prior experience, it was decided to design four stand-alone CPD MOOCs focusing on the required key content areas on OER and OEP. Since these are meant for practitioners and professionals in the field, the duration of each CPD MOOC is to be limited to four weeks, with an expectation of 3-5 hours of learning time per week.

Considering the fact that a MOOC is an online course, the basic requirements such as having an organized structure with start and end dates, course materials, learning and assessment activities constructively aligned with the learning outcomes, and adequate learner support features were identified. At the same time, recognizing that a MOOC should not only promote independent learning but also provide an opportunity for learners to connect, collaborate, and engage in the learning process, key features such as making the learning environment flexible, facilitative, challenging, motivating, interactive, resourceful, contextualized and personalised were thought-out. In order to maintain the 'openness' and 'massiveness' of a MOOC, it was decided to provide free and open access, multiple/lateral entry options (for the four CPD MOOCs), multiple options in learning and assessment tasks, and varied multimedia formats to cater to diverse learner needs and individual differences. These CPD MOOCs will be released under a Creative Commons license, thus making them fully 'open', in terms of re-usability.

A summary of the learning experience design of the CPD MOOCs in line with guiding principles of effective, efficient, and engaging (e^3) teaching is presented in Table 1.

Table 1: Design strategies of the CPD MOOCs in line with guiding principles for e³-teaching

Guiding principles for e3-teaching (Source: Naidu, 2010)	Design strategies of the CPD MOOCs
1. Teachers and learners are clear about the learning outcomes (see Naidu, 2007).	Specific learning outcomes for each CPD MOOC formulated, in line with the key competency- 'Ability to integrate OER and adopt OEP in professional practice'.
2. Learning is situated within a meaningful context and within the culture and the community in which learners live and work (Merrill, 2002).	Learning scenarios created for each CPD MOOC (in the form of short videos), reflecting real life situations of practitioners.
3. Learners are engaged in pursuing and solving meaningful and real-world challenges and problems, and where they have opportunities to work on a variety of problems and tasks of increasing complexity with timely and useful feedback (Barrows & Tamblyn, 1980; Hattie & Timperley, 2007; Merrill, 2002).	Learning activities created as challenges within the scenarios, similar to real life challenges. A variety of activities with increased complexity embedded across the four CPD MOOCs. OER integrated as supportive learning resources. Peer feedback and tutor feedback mechanisms built in.
4. The learning activities in these learning situations are clearly articulated and explicitly linked to knowledge and skills already mastered (see Merrill, 2002; Naidu, 2007).	Three types of learning/assessment tasks - Individual activity (a creation); Collaborative activity (discussion forum); Reflective activity (self-reflections), linked with the learning scenario, and existing knowledge/skills of learners.
5. Learners, while working on learning situations, are required to think for themselves by reflecting in and upon their actions and regulating their own performance (Naidu & Oliver, 1999).	Learning/assessment tasks designed to encourage reflecting on their actions. Requirement to maintain a reflective journal, to promote reflective practice.
6. The development of understanding is promoted as a social process with learners acting upon authentic situations in groups and with dialogue, discussion and debate (Barrows & Tamblyn, 1980; Vygotsky, 1978).	Peer-facilitated discussion forum to support co-construction of knowledge and community building. Links to social media to facilitate networking and social learning.
7. The assessment of learning outcomes is closely aligned with the learning context (Spector & Koszalka, 2004).	Constructive alignment of learning/assessment tasks with the intended learning outcomes.
8. The assessment of learning outcomes is linked to meaningful problems and tasks, and aimed at helping students further develop their knowledge, skills and problem-solving abilities (Spector & Koszalka, 2004).	The learning activities directly linked with the learning scenario, function as assessment tasks - Individual activity (a creation); Collaborative activity (discussion forum); Reflective activity (self-reflections).
9. The assessment of learning outcomes is designed to develop self-regulatory and meta-cognitive skills (Spector & Koszalka, 2004).	Assessment rubrics created for each assessment task to facilitate development of self-regulatory and meta-cognitive skills among learners.

The SBL pedagogical approach provided a useful framework to plan the design strategies in line with appropriate theoretical constructs indicated in Table 1. The process involved identifying the overall key competency, formulating specific learning outcomes for the four CPD MOOCs, creating learning scenarios reflecting real life challenging situations and developing a variety of learning/assessment tasks supported with OER integration as learning resources, based on the 'learning engine' framework (Naidu & Karunanayaka, 2014).

Several innovative design features were incorporated here. The learning scenarios which act as 'triggers' to activate learning, are to be presented in short video form, to gain learners' attention and situate them in the learning context in a motivating manner. At the end of each video, the role to be played by the learner will be indicated as a challenge faced. This is the first task in the form of a 'creation' of an artifact, enhancing individual efforts in finding solutions to the challenge in a creative way, to promote creative learning.

The second task requires sharing of their creations in the peer-facilitated discussion forum, to receive and provide peer feedback, encouraging collaborative learning and co-construction of knowledge. Links will also be provided to social media (eg. Facebook closed group) to facilitate networking and social learning.

To support learner engagement in these activities, various media forms of carefully selected OER will be linked appropriately. These will offer the relevant and specific content, to support individual and group knowledge construction.

The third and the final task is writing a self-reflection at the end of learning experience, to promote reflective learning. Assessment rubrics are provided for each task that will help facilitate self-regulated learning and meta-cognition. As evident by Table 1, all these innovative design features are supported by theoretical constructs and guiding principles of effective, efficient, and engaging teaching and learning.

What challenges were faced in the design of learning experiences of the CPD MOOCs on OER and OEP and how were these challenges met and overcome?

Designing specific strategies in accordance with the complex nature of a CPD MOOC, and maintaining its participatory and distributed nature, while promoting independent, self-regulated and life-long learning was very challenging. However, various strategies were adopted to overcome these challenges. Table 2 presents a summary of the key challenges faced by the participants and what strategies supported overcoming those, as revealed by the self-reflections and focus group discussions.

Table 2: Key challenges faced and strategies to overcome them

Challenges	Strategies to overcome	Supportive quotes
Novelty of the concepts – MOOCs; OEP; SBL	Expert guidance	*…By actively participating I have gathered good knowledge about MOOCs. Never knew how a MOOC should be… …Team leaders' guidance, discussions, emails…supported… …That is a very good experience for me to get the views of a professional group of researchers as well as academics…*
	Concept mapping	*…Now I have a clearer idea about the CPD MOOC and how it should be developed. The process so far was really rewarding with lot of experiences and knowledge that will sharpen our way of thinking and acting…*
Creation of learning scenarios	Peer group discussions	*…Challenge was to think…how, different levels and professions are addressed by a scenario… …We had to revise our outputs several times...*
Development of learning/ assessment tasks	Distributed work	*…First going through the activities individually and then pooling our ideas together as a team was highly productive… … Assigning work to each member led me to understand the process well…*
	Collaborative work	*…Most of the time we used the collaborative group work in designing of activities in the course... …Development was done step by step with group discussions...*
	Structured workflow	*..We have been regulated by learning outcomes, constructivism, feasibility, customer attraction, being realistic, time and simplicity etc..*
	Reflective practice	*…Also we got an opportunity to do the presentations on what we have developed in the group. The recap sessions and collaborative activities helped us to improve the way we think …*
Time constraints	Interactive workshops	*…It took some time to get into the correct track. The time that needed to allocate for the work is one of the major barrier for me… …Difficult to find time to do all the work. Whatever done during the interactive workshops was the most productive…*
	Constant email communication	*…email communication kept us informed about the next stage…*

For the majority of the participants the MOOC concept was novel, and some of them were not familiar with the concepts of OEP and SBL too. The constant guidance provided by the team leaders via email, and engaging in group discussions and concept mapping were supportive for them to become familiar with these concepts. Development of learning scenarios was found to be quite challenging, and it took several rounds of very intensive work, producing many versions of individual and group efforts to achieve consensus.

While the focused and structured workflow during the interactive workshops supported development of learning/assessment tasks constructively aligned with the learning outcomes, it was challenging

as well. All participants appreciated the interactive workshops during which everyone was able to actively participate and collectively contribute towards the CPD MOOC design. Time constraint was a common factor for all participants. Engaging in distributed individual work, presenting and receiving peer feedback, and collaborative group work during the interactive workshops were emphasized as very supportive strategies to minimize and overcome the challenges.

Concluding Remarks and Way Forward

A major purpose of the work that is reported in this article is to push the boundaries of the design of MOOCs and especially for continuing professional development of practitioners. These are people, often with very little disposable time, and in need for just-in-time learning opportunities in open and flexible formats. They need a lot more than subject matter content knowledge, which is often what they are fed. They need to know how to approach problem solving in situ.

The majority of contemporary MOOCs are failing to adequately meet these needs. This project is an example of how we can do better with smarter learning experience designs and without placing undue strain on limited resources, as is often the case. This project also lifts the conversation around the role of MOOCs in the continuing professional development of practitioners to another level of sophistication. It points out that contemporary MOOCs are failing to learn from the lessons of learning and teaching online and repeating many of the mistakes. It suggests that we can do better with attention on better design of the learning experience of practices on a large scale.

Our thesis is that the next generation of MOOCs have to be better than what we have seen. And this project is a step in that direction. This is the first paper on this work that has only just begun. Its focus is on the analysis and the design aspects of this project. In the coming months and years, we look forward to offering our readership more insights on our innovations and initiatives.

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