

Teacher Education MOOCs for Developing World Contexts: Issues and Design Considerations

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Abstract

There is a massive shortage of teachers worldwide. This shortage is particularly acute in developing countries. Distance-oriented education has been hailed as one of the possible solutions for resolving this problem. In recent years, new generations of Web-based distance-oriented education models have come to the fore; the latest of which are MOOCs. In this paper, the issues and design consideration for MOOCs will be discussed. These include the pedagogical affordances that MOOCs must have for their successful contribution to teacher education, the suitability of MOOCs for teacher education in developing world contexts and the technological affordances vis-à-vis the needs of the learner, existing technological infrastructures, and e-learning readiness skills.

Background/Introduction

According to a UNESCO monitoring report, by 2015, the world will need at least an additional 2.6 million teachers in order to ensure that every child receives a primary school education [1].

This need for teachers is most acute in developing countries in sub-Saharan Africa, the Arab States, and South and West Asia.

In order to meet these massive needs, distance-oriented education [2] [3] including various technology-enhanced models, methods, and modes [4] have been put forward as possible solutions. Specifically, mobile technologies, and web-based models that include computer-mediated communication platforms, webcasts and webinars, OERs, and online courses are examples of the most recent generation of these models.

Notably, over the past few years, Massive Open Online Courses (MOOCs) have been gaining attention as a disruptive force that could change the face of higher education around the world [5]. In addition, their promise as well implications and possible usefulness for education in developing countries has received considered attention [6] [7].

However, the design, development and facilitation of MOOCs are still in the early stages and what constitutes a successful and effective MOOC has still yet to be determined. So, the purpose of this paper is to contribute to the discourse by focusing on the issues and factors that should be considered before and during the design of teacher education MOOCs for use by learners in developing countries. First, MOOCs in terms of the required pedagogical affordances for effective teacher education will be discussed. Second, the various types and levels of teacher education will be reviewed in light of the appropriateness of MOOCs as learning and teaching platforms. Third, the technological affordances of MOOCs and their suitability for teacher education in developing world contexts will be examined.

MOOCs and the required pedagogical affordances for teacher education

The pedagogical affordances of MOOCs can be described as those “unique features sets and characteristics” they encapsulate that “add value to the learning experience, over and above what

might be expected without the technology” [8]. In order to understand these affordances, it is apt to review them within the contexts of what constitutes a good teacher preparation program and the attributes a good teacher must have. In this regard, in a recommendation concerning the status of teachers, UNESCO and the ILO adopted a recommendation on the status of teachers that outlined the various elements of a teacher education preparation program [9]. These elements include general studies, the main elements of philosophy, psychology, and sociology as they apply to education, the theory and history of education including comparative education, experimental pedagogy, and school administration and the methods of teaching various subjects. In addition, students should undergo studies related to their intended fields of practice, and engage in the practice of teaching and conducting extracurricular activities under the mentorship of fully qualified teachers. With respect to what constitutes good teaching, after a review of the literature, Burns [4] outlined five attributes of a good teacher, which tally well with the UNESCO/ILO recommendations. These include a strong level of domain content knowledge, the adoption of a structured approach to instructional activities, a strong pedagogical content knowledge, having knowledge of how students learn, and having a strong sense of self-efficacy.

So, MOOCs must afford learners in teacher education programs the features, tools, resources and interactions that will enable the acquisition of the various aforementioned elements of good teaching. These can be outlined as follows:

1. MOOCs must be able to facilitate the acquisition and mastery of domain content knowledge that includes general education as well as focused knowledge of a student’s major specialism.
2. MOOCs must facilitate the acquisition of knowledge skills related to the design and delivery of structured instructional activities.

3. MOOCs must provide opportunities for students to reflect on both the knowledge and skills they acquire, and on their in-the field teaching practice experiences.
4. MOOCs must provide a platform for social interactions between learners and teacher educators, practicing teacher mentors, other experienced teachers, and their peers.

The appropriateness of MOOCs for different categories of teacher education

Teacher education is a complex business that requires a multifaceted and multi-layered approach due both to the many different learning needs of the world's children as well as the diverse set of competencies that need to be acquired by teachers. In order to determine the appropriateness of MOOCs for teacher education, it is first necessary to delineate the various types and categories of teacher education specifically as they relate to developing world contexts. Perraton [3], in a report on the role of open and distance learning in teacher education, categorized teacher education into initial training and continuing professional development.

The initial training of teachers could take the form of either pre-service or in-service teachers [3]. Pre-service teachers requiring initial training would be those that have had no training prior to getting a job as a teacher in a school. In-service teachers requiring initial training on the other hand are those individuals who already have jobs as teachers, but who never had any initial formal training as teachers. The continuing professional development of teachers can be categorized into teachers who already have a teaching qualification but need upgrading, teachers who need reorientation education due to curriculum change, and teachers' career development.

The appropriateness of MOOCs as teaching and learning platforms for teacher education would depend on how it is being

used to support the various types and levels of teacher education. For example, the current design of MOOCs that use various content presentation and automated assessment methods would lend themselves well to the acquisition of content knowledge required in both the initial training and aspects of the professional development of teachers. Peer assessment methods currently being used by MOOCs such as Coursera could also work in the acquisition of skills related to the design and development of instructional activities required for teachers in initial teacher preparation programs. However, the assessment criteria and peer pairing would have to be carefully thought out with an additional component of teacher-educator mentors monitoring the quality of the products being designed and developed. The challenge arises in figuring out effective and efficient ways to reinforce various aspects of the in-the-field teaching experiences required for initial teacher preparation programs within the MOOCs. Reflection pieces and field reports could be peer-assessed but the most effective feedback would come from experienced teacher educators. The review and provision of such feedback would not lend itself well to automated methods.

The same issues arise with the supporting of various aspects of the continuing professional development of teachers. Successful teacher professional development requires a social and community-centered approach [10] [11] [12]. According to Barab et al. [10] this approach should foster a culture of sharing and provide sustained support for teachers as they review and reflect on their beliefs and practices. Teachers for instance needing reorientation education due to curriculum change may have belief and conceptual change issues that may need to be addressed. These require sustained interventions and can take time, sometimes months and years to bear results [13] [14]. Target teachers may need to be continually presented with the new concepts and content in different ways over a period of time before they begin to experience a disconnect between their current beliefs and this new information [15] [16].

According to Gaible and Burns (17), teacher professional or career development (TPD) can be categorized into standardized TPD, site-based TPD, and self-directed TPD. Standardized TPDs invariably include the use of training-based approaches where knowledge and skills are presented via face-to-face, broadcast, or online modes. This model is useful for exposing teachers to novel ideas, concepts, and instructional methods. Site-based TPDs invariably occur in schools, resource centers or teacher education colleges. They include the use of facilitators or master teachers and are useful for mastering pedagogic content and technology skills, and focusing on specific issues that teachers encounter in their particular schools or local environment. Self-directed TPDs entail teachers specifying their individual professional goals and selecting the plans and activities that would enable them to achieve those goals. The scope of self-directed TPDs varies depending on individual teacher needs. However, they are most useful to more experienced teachers who have a desire to augment and enrich their knowledge and skills than to less experienced teachers requiring basic or intermediate knowledge and skills.

In terms of their current designs, the appropriateness of MOOCs for teacher professional development related to career improvement would depend on what elements of the different categories the focus is on. While they could be used to serve elements of the three categories of TPD, MOOCs would best lend themselves in terms of usefulness to facilitation of standardized TPDs and certain aspects of self-directed TPDs and less so to site-based TPDs.

In order for MOOCs to fulfill the need for social interaction in communities that include teachers, their peers, teacher-educators and mentors, the parameters of current MOOC designs would have to be extended. In other words, MOOCs designed for teacher professional development would have to include more sophisticated online forums and other technology-oriented social structures and features that would support effective forms of social-constructivist learning. In addition, the standard course

design structures and their embedded instructional strategies would need to be adjusted to support the learning that can only take place over longer periods of time with sustained interventions.

The technological affordances of MOOCs and their suitability for teacher education in developing world contexts

The suitability of MOOCs in terms of their technological affordances for developing world contexts depends on the needs of the learner, the technological infrastructure in his or her location, and the preparedness of the learner in terms of the requisite e-learning readiness skills. The needs of the learner depend on the type and nature of knowledge and skills he or she requires. Certain types of knowledge and skill acquisition lend themselves better to MOOCs than others in terms of efficiency and effectiveness. For example, the acquisition of foundational conceptual knowledge and skills during a pre-service teacher preparation program could be totally carried out through an MOOC. These could be delivered through videos, and in text and audio formats through the Web. Conceptual knowledge and skills could be reinforced and assessed in a variety of ways using automated formative and summative assessment tools, peer assessments tools, and discussion forums, chat rooms, etc. However, the acquisition of practical in-classroom skills necessitates that teachers spend substantial amounts of time out in the field in actual schools. These practical skills require substantial interaction between the trainee teacher and students and trained teachers in the physical school classroom. Some of this skills training could be reinforced through activities that take place in an MOOC. It could take the form of interaction with more experienced teachers, mentor teachers and teacher educators who comment on trainee teacher reflections and have engaging and fruitful dialogues on their in-the-field classroom experiences. However, this component of learning and skills reinforcement of practical in-classroom skills acquisition in the MOOC would not suffice.

The application and use of MOOCs by learners depend on the nature and sophistication of technological infrastructure in place in his or her location. MOOC providers, Edx.org (Edx.org Help page) and Coursera.org (Coursera.org Help page) simply state that the requirement for participation in their MOOC is access to an Internet connection. Udacity.com (Udacity.com FAQs) however provides more detailed general technical requirements stating required browser versions and Internet connection speeds, computer operating systems minimum specifications, as well as specific ones for activities such as the playing of videos and online proctoring. So, in general it can be safe to say that in order to participate fully in an MOOC regardless of the provider, the learner must have access to technology that meets certain basic specifications. These include having access to a computer device (desktop, laptop, tablet, mobile), having a computer device that has browsing software and word-processing software for courses that require this, and having access to an Internet connection with reasonable download and upload speeds. In other words, for active participation in MOOCs, a learner anywhere in the world must have a fairly up-to-date computer device and access to some form of broadband Internet.

However, it is important to note that the quality and sophistication of the technological infrastructures available to learners in developing contexts is still very limited. In addition the level of ICT penetration is still very low [18]. As of 2011, the fixed (wired)-broadband subscription rate in countries under the developing world umbrella was only 4.9 percent. For active mobile-broadband subscriptions in 2011, the rate of penetration was only 8.5%. In addition, the percentage of households with Internet access in the developing world was only 20.5%. This means that the a teacher education MOOC would be out of the reach of a substantial number of teachers in the developing world, particularly those who are located in the “least developed countries” of the world [19] where even for those who could afford

to purchase or have access to computer devices, broadband infrastructures may not exist, or in many cases will be patchy.

The preparedness of the learner in terms of the requisite e-learning readiness skills is also an important factor for successful learning and participation in MOOCs. After a review of the literature, Dabbagh [20] outlined a number of attributes a successful learner should have to participate in e-learning environments. He or she should be skilled in the use of online learning technologies, particularly communication and collaborative technologies; have a strong academic self-concept and good interpersonal and communication skills; have a basic understanding and appreciation of collaborative learning and develop competencies in related skills; acquire self-directed learning skills through the deployment of time management and cognitive learning strategies.

In sum, even when learners in developing countries have access to required technological infrastructures, they may not have the requisite aforementioned e-learning readiness skills that will enable them to participate fully in MOOCs. And the reason for this is due to the limited exposure and experience of these learners to the Internet and specifically e-learning environments compared to their counterparts in developed countries.

Conclusion

The knowledge, skills, and attitudes that teachers need to acquire throughout their lifetime training and professional development as teachers is complex. As a result, when designing MOOCs for teacher education care must be given to selectivity regarding what is most effective to be taught and its fit with existing teacher education programs. Also, in this regard, there are various issues and design considerations that must be made during the possible design of an MOOC for teacher education that will be of benefit to learners in developing world contexts. A successful

design would need to incorporate features and tools that would harness research proven pedagogical principles. Consideration would also need to be given to the appropriateness of MOOCs for different kinds of teacher education. The acquisition of particular kinds of knowledge and skills can be achieved much more efficiently and effectively in MOOCs than others. In addition, the learners' access to the most appropriate technologies, as well as their preparedness in terms of the required e-learning competencies must be studied as these may vary from one developing world context to the other.

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