



Supporting professional development through  
MOOCs: the Teacher Education in Sub -  
Saharan Africa (TESSA) experience

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# Supporting professional development through MOOCs: the TESSA experience

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## Abstract

Policy aspirations for education across sub-Saharan Africa are requiring teachers to change from being transmitters of knowledge to facilitators of learning. This means that teacher education needs to change as well. At present, teacher preparation courses are highly theoretical, and many teacher educators have very limited school teaching experience. Teacher Education in sub-Saharan Africa (TESSA), open educational resources (OER) can support teacher educators in developing the practical knowledge needed, yet many see them as resources for teachers rather than themselves. Also, curricula and examination systems may restrict the incorporation of OER into teacher preparation programmes.

The TESSA MOOC - *Making teacher education relevant for 21<sup>st</sup> Century Africa* - was designed to support teacher educators in changing their practice and better support teachers in the new curricula being developed. It focused on active teaching approaches, incorporating ICT into classroom learning, and using TESSA materials and other OER. It ran three times, over two years, and nearly 7000 participants, mainly from sub-Saharan Africa (SSA), registered. For many people it was their first experience of online learning. They studied on phones, in environments where electricity and connectivity were erratic, and supported each other in local communities. Despite the challenges, the completion rates for the first two presentations were encouragingly high compared with the norm for MOOCs.

This paper analyses data from the pre- and post- course surveys from the first two presentations to understand who took part, how they studied, what they learnt and how it has impacted on their practice.

## Introduction

This paper considers the potential of open online learning to develop the quality of teacher education in sub-Saharan Africa (SSA). Massive Open Online Courses (MOOCs) and open educational resources (OER) promise a great deal for low-resource environments, yet the uptake of opportunities in the global south is low and there remains a disconnect between the OER developer and the target user community.

Drawing on professional knowledge gained in context, the FutureLearn MOOC '*Making teacher education relevant for 21<sup>st</sup> Century Africa*' was a purposeful attempt to harness open learning to address a development need. This paper draws on pre- and post- course data to examine the motivations and aspirations of the participants and evidence of the potential of the MOOC to impact on practice. It concludes with an analysis of the challenges faced by the team and recommendations for other MOOC developers aiming to support professional development.

## Background to the MOOC

### The development need

Teacher education Africa is in need of urgent change (Anamuah-Mensah *et al*, 2013; Harber, 2012; Moon & Villet, 2017). New policies and curricular advocating learner-centred approaches to teaching are requiring teachers to think and teach differently, which has significant implications for teacher educators. Although teacher educators are best placed to drive change (Cochran-Smith, 2006) there is a reluctance amongst this professional group to examine their practice and embrace the attitudes and values associated with active, learner-centred education (Moon & Umar, 2013).

Teacher educators in Africa are held in high esteem. Many are qualified to degree and masters level, whereas teaching requires only a certificate or diploma. High achieving, newly qualified teachers are often posted to colleges of education rather than to schools, suggesting that academic, theoretical knowledge about teaching is valued more highly than the practical knowledge of teaching.

Two major development projects co-ordinated by The Open University, Teacher Education in Sub-Saharan Africa (TESSA) and Teacher Education through School-based Support (TESS-India), have focused on making available contextually relevant open educational resources (OER) to support teachers in developing active approaches to learning and teaching. In work to mediate the OER, teacher educators were identified as a key professional group, as they work with large numbers of pre-service and in-service teachers. However, research by Wolfenden *et al* (2017) showed that '*the innovation in practice and the transformation in pedagogy promised by OER is.....still fragile, confined to a few converts working independently or with one or two collaborators within....institutions*' (2017: 277). The TESSA MOOC is a purposeful attempt to promote the use of OER, in the belief that through participation in, and reflection on, practice, teacher educators can be supported in developing and modelling new approaches to learning and teaching (Murphy & Wolfenden, 2013).

### Supporting professional development through MOOCs

MOOCs offer unrestricted access to learners, flexibility over how, when and where they learn, and choice over the extent to which they engage with the different parts of a course. They have the potential to provide professional learning at scale (Czerniewicz, Deacon, Small, & Walji, 2014), but they are not always successful in doing so (Milligan, Littlejohn, & Ukadike, 2014). MOOC uptake in developing world contexts is patchy (Garrido *et al.*, 2016; Liyanagunawardena *et al* ; 2013) and completion rates are generally very low (Jordan, 2015; Perna *et al*, 2014). However, evidence from a study based on the TESS-India MOOC (Wolfenden *et al*, 2017) suggests that it is possible to disrupt traditional cascade models for professional development and challenge some of the previous findings about MOOCs (Milligan and Littlejohn, 2014), through the provision of authentic tasks related to practice, trained facilitators and organised support, and consideration of the sort of technology and access available.

In a meta-synthesis of the Researching OER for Development (ROER4D) studies (Hodgkinson-Williams *et al*, 2017) concluded that the uptake of OER in the global south requires both structural and cultural factors to be in place. The next section examines the rationale for the TESSA MOOC and demonstrates how our understanding of the context (structural factors), previous learning and the findings from research contributed to the design of the MOOC.

## The TESSA MOOC

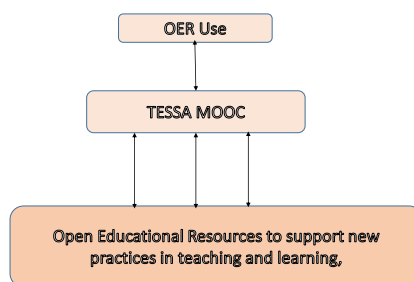
Teacher educators in Africa have qualified in a system that positions learners as passive receivers of knowledge. Now they face preparing teachers to teach in a completely different way. Learner-centred education (LCE) – the aspiration behind policies across the global south – can be viewed as a set of attitudes to learners, which conceptualises them as agentive, capable, experienced and most likely to learn through active engagement in authentic activities (Schweisfurth, 2015). The main purpose of this MOOC was to model active learner-centred teaching so that teacher educators would experience ‘active control’ (Schweisfurth, 2013:20) and have the opportunity to develop collaborative networks. Perhaps most importantly they would have the opportunity to learn something about themselves as learners

Harnessing OER needs attention if the potential of OER to address professional development needs in resource-poor environments is to be realised (Wolfenden *et al.*, 2017). The MOOC as a mediation tool for OER was developed and tested in India (Wolfenden, Cross, *et al.*, 2017). Success, in the form of 40,000 registrations and a 50% completion rate, was attributed to ‘a blend of digital and physical learning spaces, which help collapse the global into the local’ (2017:139). In the MOOC model adopted for India, local facilitators, nominated by state education officers, were trained in face-to-face workshops. This gave participants the opportunity to study as part of a group and where technical support could be made available (Li *et al.*, 2014).

In SSA, institutional structures are not as robust as those in India and there was not the element of compulsion that led to the initial uptake in India. Consequently, an African MOOC needed to be shorter and speak to local priorities. Through working in country, we identified the priorities as learner-centred, active teaching approaches and integrating ICT into classroom teaching. As an additional incentive, participants were offered a free certificate of completion.

Bonk & Lee, (2017) argued that MOOC design should give learners choice, control, fun, the opportunity for professional growth and a sense of freedom to learn. It should also include opportunities for collaboration, and guidance in finding and selecting resources. This formed the foundation of the MOOC, which was conceptualised in terms of ‘practice into theory’. Activities started with questions about practice, or a case study describing an aspect of practice. Although TESSA OER were foregrounded because of funding from the Ferguson Foundation, OER were included from other sources including UNESCO, Commonwealth of Learning and OER Africa. Figure 1 demonstrates how the MOOC was positioned as a mediating tool.

Figure 1: The TESSA MOOC mediates OER to support new practices in teaching and learning



Many of the MOOC activities were tested in workshops conducted in country with teacher educators, bringing an element of co-design to the final product through a process of authentic feedback from and revision by the end users. One significant issue raised was that although many teacher education colleges in Africa have access to the internet, connectivity is often intermittent with narrow bandwidths. The MOOC design took account of this through the provision of descriptions and transcripts for participants unable to access multi-media.

For the first presentation in 2017, a facilitation model was developed training 142 face-to-face facilitators across several African countries and supporting them in setting up institutional study groups. The training gave facilitators a preview of the MOOC and the output from the facilitation workshop was a co-designed MOOC Facilitation Guide that reflected the reality of the contexts in which the MOOC would be studied. In the second

iteration in 2018, MOOC ‘graduates’ were given the opportunity to act as mentors, supporting a local group and contributing to forum discussions in this capacity.

## The Study

The study set out to learn more about the participants, how they studied, what they took from the experience and the potential for pedagogic change as a result of participation in the MOOC.

There were three research questions:

1. Who were the MOOC participants? What were their aspirations and motivations?
2. How did participants experience the MOOC?
3. What is the evidence that the MOOC can impact on practice?

Data was drawn from the pre- and post-course surveys from both presentations. Permissions to use the data for research purposes were obtained at registration and all the data was handled anonymously.

The analysis was carried out in the context of what is known about the uptake of open learning. Survey questions relevant to the research questions were selected (see Table 1). The responses were analysed using an emergent coding system. Codes were then grouped together into categories in order to provide a clearer view of the findings. For example, 13 codes were identified in responses to the question:

*What were you most proud of achieving or doing as a result of the MOOC? (Post-course, Q9).*

For reporting purposes, the responses were grouped into

- using ICT more
- awareness and use of OER
- impact of teaching and learning (more learner-centred)
- completing
- being a better professional
- other

In response to the question: *Describe what changes you have noticed in your how your students respond to your teaching (post-course, Q24)*, 17 codes were identified. These are reported under the headings:

- greater involvement in learning
- developed specific skills (more creative, more resourceful, more curious etc.)

Responses that did not fit into these categories were labelled ‘other’.

Table 1: A summary of the data set used to inform the research questions

Research question	Pre-course survey question (number of responses MOOC1, number of responses MOOC 2), question no.	Post-course survey question (number of responses MOOC1, number of responses MOOC 2), question no.
Who were the MOOC participants?	Please tell us your job role (n=247, n=102) Q6	
What were their aspirations and motivations?	Which of the following best describes why you want to take this course? (n=392, n=164) Q1	
	What do you hope to achieve by taking this course? (n=369, n=148) Q2	
What was their experience of the MOOC?		How much did you enjoy your course experience overall? (n=262, n=105) Q2
		What was your favourite part of the course and why? (n=259, n=104) Q3

		What were you most proud of achieving or doing? (n=243, n=99) Q9
		Which of the following statements do you agree with? (n=217, n=89) Q7
		How well did the course help you meet your learning goals? (n=254, n=104) Q8
		What challenges did you face in studying the course? (n=250, n=45) Q18
		Did you use any of the following to help you study during the course? (n=251, n=99) Q16
		In how many different weeks did you use the following to help you study the course? (n=251, n=97) Q17
What is the evidence that the MOOC can impact on practice?		Has there been a change in how your students respond to your teaching? (n=226, n=89) Q23
		Describe what changes you have noticed. (n=199, n=61) Q24

## Limitations

The response figures given in Table 1 represent a return rate of approximately 10% for MOOC 1 and 7% for MOOC 2. The difference may reflect the impact of facilitation, given no facilitation workshops occurred before MOOC 2. Although not all participants and completers submitted responses to the surveys, the number of responses was judged to be sufficient to draw some tentative conclusions. The other notable limitation was the variation in detail provided in the free responses and the different meanings that may have been attached to terms used. This meant that a level of interpretation was necessary in the analysis. By grouping the codes together for reporting circumstances, some of this potential variation was removed.

Although the findings presented here are tentative, they provided insights that highlight the potential of MOOCs to support professional development when the learning design takes account of local needs and contextual knowledge.

## Findings

The findings will be reported against the research questions.

Who were the MOOC participants? What were their aspirations and motivations?

The demographic information concerning MOOC participants is given in Tables 2 and 3.

Table 2: MOOC Participants (joiners)

Country	MOOC 1		MOOC 2	
	Number	%	Number	%
Zambia	464	20	119	6
Nigeria	372	16	492	24
Kenya	180	8	379	18
Malawi	180	8		
Uganda	132	6	176	8
Ghana	128	5	114	6
South Africa	64	3	153	7

Tanzania	53	3	28	1
Zimbabwe	18	1	28	1
Other/unknown	761	23	601	29
	<b>2352</b>		<b>2092</b>	

Table 3: The demographics of MOOC Joiners

Age range	MOOC 1 (%)	MOOC 2 (%)
18-25	8	14
26-35	20	28
36-45	29	32
46-55	28	17
56-65	10	6
>65	2	1
Unknown /unreported	3	2

Three pre-course survey questions about job role, previous experience and understanding of the subject revealed that participants believed they had some prior understanding (94/93%) and understood the subject fairly or very well (73%/73%). Unsurprisingly, most were working in a related field (70% / 61%).

Identifying the participants' job role from the free response question was more difficult. Non-specific responses such as 'teacher', 'lecturer', 'educator' gave no indication of the institution or phase of education. In both iterations of the MOOC, 14% of those who responded identified as lecturers. These were assumed to be working in higher education institutions, although no assumptions could be made about the courses they worked on or the nature of their work. The role of 'teacher' was identified by 23% in MOOC 1 and 46% in MOOC 2, perhaps reflecting the encouragement given to teachers by some teacher educators from MOOC 1. However, it could not be assumed that all those identifying as 'teacher' were based in school. Some responses made clear that they were teachers in an HE context and some in a school context. In MOOC 1, 44% identified as a teacher educator or teacher trainer, but only 25% in MOOC 2. These participants were assumed to be in HE, but it was not possible to distinguish whether they taught subject content, pedagogy or both.

In both iterations of the MOOC, participants reasons for doing the course were mainly connected to advancing, developing or staying up to date in the profession (83%). To a free response question asking for other reasons or more detail, 368 participants responded in MOOC 1. Of these, 7% focused on career development or certification. Learning about ICT was cited as a driver by 45%, and 11% had reasons connected with staying up to date. For example, *"I need to learn contemporary approaches"* and *"I want to stay abreast with developments"*.

Sharing and networking were mentioned by only 3%. Improving the outcomes and experience of learners, whether pupils in school or students in HE, was only cited by 8%. Almost 42% were focused on developing their own professional knowledge and practice. Improving teacher education more generally was cited by 14% as an important reason for doing the course.

The 168 participants who responded to the same question in MOOC 2 revealed similarities and significant differences between the two groups. Similar results were found for improving ITE, learner outcomes, career development and sharing and networking. However, only 25% mentioned ICT, but more emphasis was found on being up-to-date (23%) and being part of an international teacher education community.

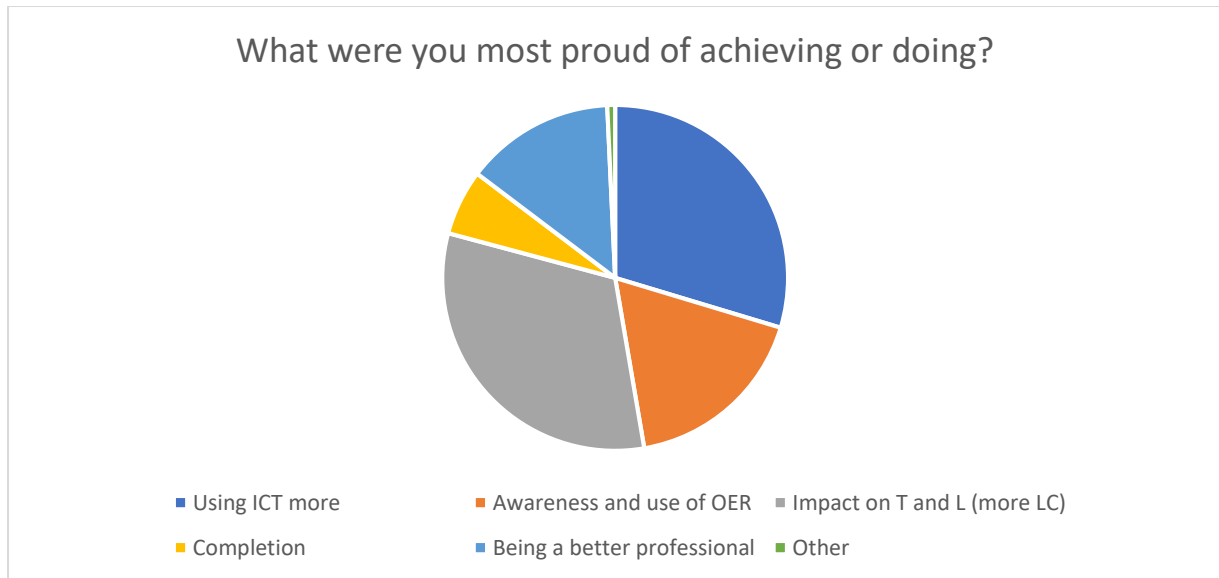
### How did participants experience the MOOC?

The overall completion rate across the two MOOCs was 37%. This compares favourably with the average MOOC completion rate of 12 – 15%, and in the context of SSA represents a significant success. In MOOC 1 facilitators were trained, and TESSA sponsored participants were registered through the OU. The completion rate for TESSA participants was 58% (42% overall). In MOOC 2 a 'sponsored MOOC' model was used that did not differentiate between TESSA and other participants and the completion rate was significantly lower at 30%.

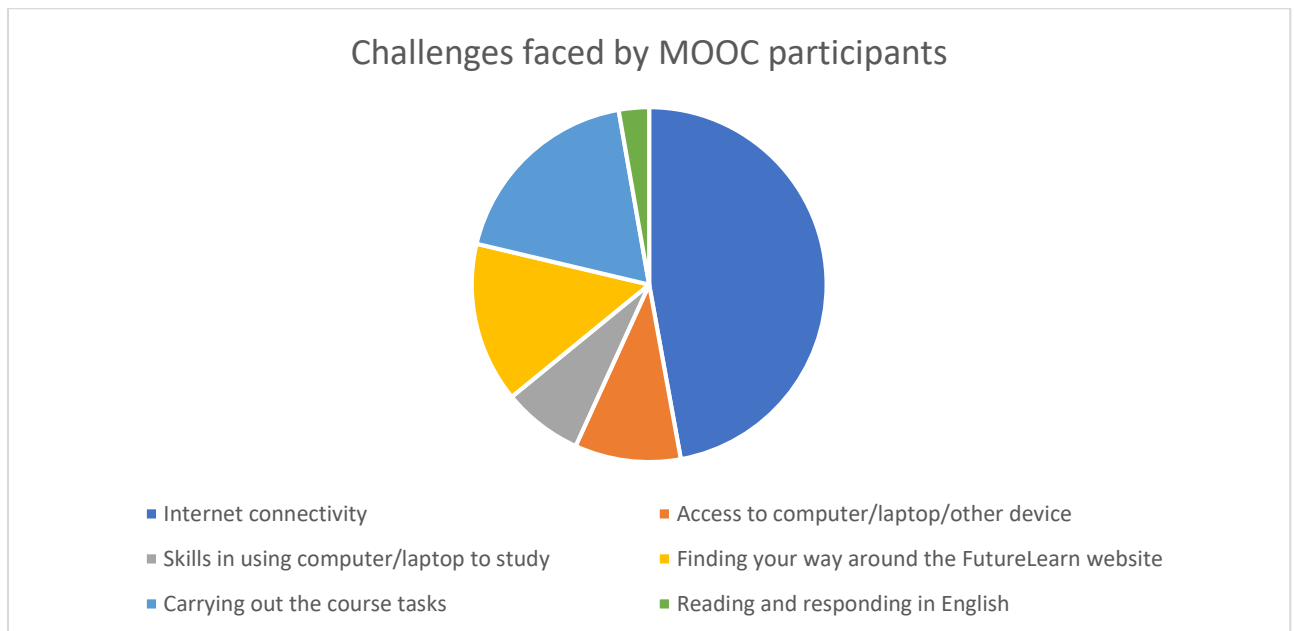
Participants enjoyed the MOOC with 93% (MOOC 1) and 94% (MOOC 2) selecting 'I enjoyed it a lot'. The most popular part of the course was *Integrating ICT into teaching*. In response to the question 'What was your least favourite aspect of the course?' 46% of respondents selected 'none'. Of the remainder, 26% referred to some aspect of the learning design and 25% identified a specific activity as their least favourite aspect.

Across the two MOOCs, 96% of respondents reported that the course helped them to meet their learning goals. The aspects of their achievement that they were most proud of are reported in Figure 1:

Figure 1: What are you most proud of achieving or doing as a result of taking this course?



The challenges reported by participants are shown in Figure 2:



Other significant challenges reported in the free response section included power cuts and having enough time to study.



The final aspect of the participant experience that we considered was how participants studied. The course discussion and discussions with colleagues accounted for nearly 40% of the responses, which, given the emphasis in the literature on teacher learning on collaborative learning (e.g. Shulman & Shulman, 2007), and the relative low percentage of participants who cited ‘sharing and networking’ as a motivation for taking part, is very encouraging.

What helped participants to study during the course is presented in Figure 3. Social media in the form of WhatsApp, Facebook and text messages proved to be a significant mode of support accounting for 29% of responses.

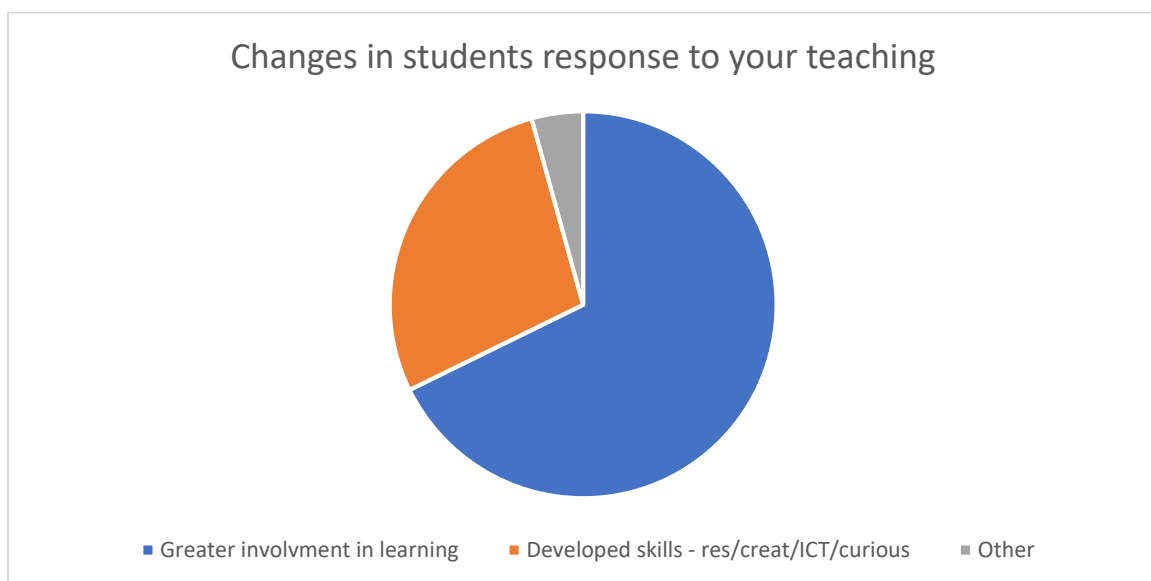
Figure 3: What helped participants to study during the course?



What is the evidence that the MOOC can impact on practice?

We asked participants if there had been a change in how their students respond to their teaching since studying the course. Across both presentations, 70% of respondents replied ‘yes’. Analysis of the subsequent free response question, which asked them to describe the changes they had noticed, is given in Figure 4:

Figure 4: In what ways did your students’ behaviour change as a result of you studying the MOOC?



'Greater involvement in learning' includes phrases such as, *'more participation'*, *'they contribute more'*, *'they are more engaged'*, *'they understand me better'* and *'attendance has improved'*. The skills that were specifically mentioned included: *'more creative'*, *'they are more resourceful'*, *'they use their Smart phones more'*, *'they are more curious'*. Several respondents declared that *'there are been great changes'* without being specific.

## Discussion

The participants were well qualified and could perhaps generally be considered to be mid-career. As was found by Milligan and Littlejohn (2017) the participants did not do the MOOC to further their careers, but were motivated by the opportunity to develop their knowledge and practice and keep up with current trends and practices in other countries. The desire to improve teacher education or the outcomes for students was also a notable motivation and cited by 20% of the participants.

In this study, in contrast to the findings of Milligan and Littlejohn (2017), several respondents (4%) mentioned the opportunity to share and network with other professionals as a motivating factor. This is perhaps surprisingly low given that models of teacher learning cite collaboration as key in the co-construction of knowledge about teaching (Darling-Hammond, 2006; Shulman & Shulman, 2007). Significantly, although only 4% of participants gave sharing and networking as a motivation for studying the MOOC, 40% reported that they had engaged with the online discussions and had had discussions with colleagues. The impact of this sort of collaboration on professional practice needs to be explored in more detail in the next phase of this research.

The data on motivation for doing the course suggests that these professionals were responding to the requirement of recent policy and new curriculum demands to change their practice and develop teachers who would be able to teach using learner-centred, participatory pedagogy.

The MOOC achieved a relatively high completion rate and high levels of participant satisfaction. The provision of a free certificate proved to be an important incentive. This may reflect the perceived position of teacher educators as 'experts', reinforcing this aspect of their professional identity. The high levels of satisfaction and the reported pride in what they achieved suggests that the learning design did provide, fun, the opportunity for professional growth and a sense of freedom to learn (Bonk & Lee, 2017). The focus on practice is novel in this context (O'Sullivan, 2010) with the result that many very highly qualified people found activities that stimulated and challenged them. The facilitation model worked well. For MOOC 1, the focus was Zambia and Malawi, resulting in significant uptake. For MOOC 2, the similar resources were not available, but a MOOC graduate and TESSA Ambassador from Kenya, used her role as a visiting professor in Nigeria to motivate participation. Here, many very learned, academics found activities in the MOOC to interest and motivate them.

The sought-after outcome for professional development is the possibility of pedagogic change. The evidence from this study is encouraging, with teacher educators reporting increased engagement from their students. Having noticed positive changes in their students, it is possible that new practices will become embedded and that pre-service and in-service teachers will have the opportunity to experience the sort of teaching approaches that they are being expected to adopt.

MOOC 3 has just finished and the intention is to strengthen the study in the future, by conducting in-depth interviews with MOOC completers from different countries and different settings.

## Conclusion

The success of the TESSA MOOC demonstrates that MOOCs do have the potential to support professional development provided resources are devoted to providing active facilitation. Instrumental in the success was the clear identification of a development need, a learning design that explicitly supports that need, and a facilitation model that provided localised support. It has been shown that despite challenges in connectivity, and the pressure of studying alongside other duties, participants were motivated to solve local problems in order to take part, and that they valued the opportunity. There is emerging evidence that pedagogic change can follow from such experiences.

## Acknowledgements

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