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# Moving forward with TESSA: what is the potential for MOOCs?

## Abstract

Teacher Education in sub-Saharan Africa (TESSA) is an educational development project run by The Open University, UK. Working collaboratively with partners in Africa, The Open University published (in 2010) a set Open Educational Resources (OER) which support teachers in developing participatory approaches to learning. With the global focus for education shifting from 'access' to 'quality' (Sustainable Development Goal, 2015) the TESSA OER remain as relevant as ever; student-centred pedagogy is at the heart of the development of 21<sup>st</sup> Century skills.

In a similar project, Teacher Education through School-based support in India (TESS-India) The Open University developed a Massive Open Online Course (MOOC) to support teacher educator professional development. The purpose of this paper is to present the TESSA strategy for 2016-2019 and to draw on data from the TESS-India MOOC in order to argue for a MOOC for African teacher educators.

The MOOC had an innovative design drawing on socio-cultural theories of learning; it was task-based, with face-to-face facilitation provided in the project's target states. Data comes from pre-and post- course surveys for the MOOC; weekly surveys conducted during the pilot phase and weekly reports from MOOC facilitators, including some case studies.

The response to the MOOC was overwhelmingly positive and a completion rate of 51% was achieved (compared to the average for MOOCs of around 12%). Whilst acknowledging that the African context is different, the TESSA team believe that a MOOC for teacher educators in Africa would support the strategic objective of improving teacher education across the continent.

Key words: MOOC, TESSA, Student-centred pedagogy, Open Educational Resources, teacher education

## Moving forward with TESSA: what is the potential for MOOCs?

### Introduction

The focus for education in the Sustainable Development Goals is improving the quality of educational outcomes (EFA GMR team, 2015). In order to achieve this aim, the quality of teaching needs to improve (SEIA, 2007), as does the quality of teacher education (Moon & Umar, 2013). Current models of teacher education, with the emphasis on academic theory, are not fit for purpose and are often not contextually relevant (Dyer et al., 2004; O'Sullivan, M., 2004).

The Teacher Education in Sub-Saharan Africa (TESSA) programme, aims to address the issue of the quality of teaching by providing teachers with authentic activities, directly related to the curriculum, to carry out in their classrooms that will promote active approaches to learning. TESSA OER, versioned for 10 countries were published online in 2008. TESSA has been most successful when it has been embraced by teacher educators and incorporated into teacher education programmes. However, many teacher educators have never experienced the pedagogy that they are being asked to promote so attempts to mediate the TESSA OER have focused on this group. The new three-year strategy for TESSA continues this focus, with three strands of activity: to improve access to the OER by making them accessible on all types of mobile device; to strengthen existing networks through targeted activity in selected institutions; and to build capacity of teacher educators across the continent. This is represented below.

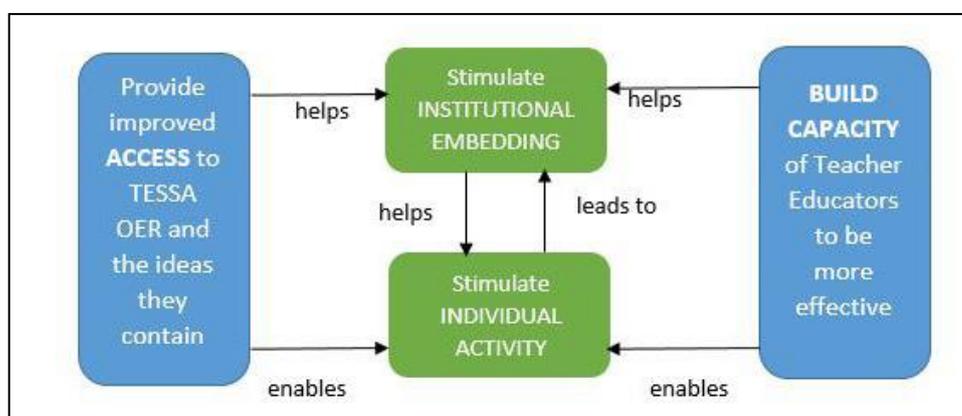


Figure 1: The TESSA strategy 2016 - 2019

Our vision is that TESSA is integrated into teacher preparation and in-service courses across Africa and that Governments, NGOs and other organisations with an interest in teacher development, turn to the TESSA OER and adapt them, if necessary, for their own purposes. In order to achieve this vision, we are working on the website in order to improve the accessibility of the materials; we have identified a set of countries where we will be working with specific institutions to build awareness of TESSA and we are putting in place a number of initiatives to build the capacity of teacher educators. These will include building local partnerships with a range of organisations. However, effective partnerships need an activity

to provide a focus for partnership work and we are proposing to develop a Massive Open Online Course (MOOC) for this purpose.

MOOCs are a relatively recent innovation. They have high enrolment ('massive') and offer a middle ground for teaching between the structured classroom environment and the 'chaotic open web of fragmented information' (Siemens, 2013). They originated in Canada and the USA but despite being seen by many as an opportunity to reach learners in development contexts, the majority of participants are educated males based in the developed world (Bulger, M.; Bright, J.; Cobo, C., 2015). MOOCs are free, although it is often possible to pay for a certificate if the course is completed successfully. Assessment is through quizzes or peer review, rather than tutor-marked assignments.

MOOC models are evolving quickly, but broadly speaking, at present there are xMOOCs, cMOOCs and quasi-MOOCs. xMOOCs position the teacher as 'expert' and tend to make use of recorded lectures. cMOOCs are based on a connectivist pedagogic model in which knowledge is seen as generative and there is a high degree of learner choice. Quasi MOOCs provide web-based tutorials based on OER, not necessarily packaged as a course (Siemens, 2013).

A different model has been developed by the Open University as part of a sister project to TESSA, Teacher Education through School-based Support in India (TESS-India – [www.TESS-India.in](http://www.TESS-India.in)). The TESS-India MOOC specifically targeted teacher educators in seven states, providing them with the opportunity to experience a learner-centred pedagogy that built on their prior knowledge and expertise, and provided collaborative learning experiences. The MOOC was 'task-based', and mindful of the low bandwidth for internet connections across much of India. It included weekly contact classes in the project's target states. The TESS-India MOOC had a high completion rate and high levels of participation across India. The rest of this paper describes and analyses the MOOC and the reasons for this success, and sets out a vision for a MOOC in Africa.

## Designing a MOOC

Teacher Education through School-based Support (TESS-India) involved the production of a set of OER for Secondary and Elementary teachers in English, Maths, and Science, and for Elementary teachers, in language and literacy. The OER include activities for teachers to try in their classrooms and case studies describing what happened when a teacher tried the activity, or a similar one. The principle is similar to TESSA and the units build on what has been learnt during the ten years of the TESSA programme.

The TESS-India MOOC was designed for a specific audience: teacher educators. The purpose was to introduce the idea of OER and the TESS-India OER in particular to teacher educators, and they undertook activities directly linked to their professional role. The rationale underpinning the MOOC was that teacher educators have the potential to broker real change in teaching and learning (Cochran-Smith, 2003; Murphy & Wolfenden, 2013). If they can be persuaded to design courses that truly model student-centred pedagogy and focus on the practicalities of classroom teaching, while setting them in a strong conceptual framework which sets out a clear vision for teaching, then real change will be achieved. The

TESSA OER and TESS-India OER embody a vision that is consistent with policy aspirations across the globe; the MOOC makes this vision explicit and supports teacher educators in how to work effectively with teachers – both pre-service and in-service. The operational model for the project involved a central team in Delhi with State Representatives working within existing structures in each of the seven target states to promote TESS-India, the aim being that TESS-India OER should be integrated into state run teacher education programmes. In this way, the vision articulated in the National Curriculum Framework for Teacher Education (2009) is more likely to become a reality.

Research suggests that MOOCs should not be overlong or too demanding (Ferguson, R.; Clow, D.; Beale, R; Cooper, A.J.; Morris, N.; Bayne, S.; Woodgate, A., 2015). It was decided that six weeks, with between 4 and 6 hours of study a week would be manageable for people who are employed full-time. There were six assignments – three quizzes, one extended forum post and two peer-reviewed exercises. If all were completed then a certificate was available for a small fee. Usability testing suggested that a hybrid model would be helpful as levels of digital literacy amongst the target group were not as high as expected. The MOOC ran twice – once as a pilot (May – June 2015) and again in Nov –Jan 2016. During the pilot, contact classes were organised by the State Representative in each of seven target states. These ran weekly, for nominated participants. They provided the opportunity to meet other participants, and, if connectivity was poor in their place of work, for them to get on line and complete the activities. During the second presentation, participants from the pilot took on the role of facilitators and many more classes took place.

There are two separate elements to the MOOC design: the online activities and the support which was put in place.

### Online activities

The TESSA and TESS-India OER are underpinned by a socio-cultural view of learning, in which participants learn through taking part in activities and working with others (Lave & Wenger, 1991). Teacher learning is considered to be situated in practice with an emphasis on collaboration and reflection (Putnam & Borko, 2000). Within this model, dialogue is important, as are authentic, culturally relevant learning activities. At The Open University, the learning design team have identified different types of online learning activities. The aim is that a unit of work - such as a MOOC - should provide a range of types of activity. The activities are described in Box 1.

**Assimilative** – Students gather information about new theories and concepts - *Read, Watch, Listen, Think about, Access, Observe, Review, Consider, Study*

**Finding and handling information** - Students are actively and critically engaged in gathering and manipulating information - *List, Analyse, Collate, Plot, Find, Discover, Access, Use, Gather, Order, Classify, Select, Assess, Manipulate*

**Communication** – students work with others to make new links and to share their developing understanding - *Communicate, Debate, Discuss, Argue, Share, Report, Collaborate, Present, Describe, Question*

**Productive** - Students create a piece of work or an artefact that can be evaluated - *Create, Build, Make, Design, Construct, Contribute, Complete, Produce, Write, Draw, Refine, Compose, Synthesise, Remix*

**Experiential** – Students apply their knowledge and understanding in a real life setting - *Practice, Apply, Mimic, Experience, Explore, Investigate, Perform, Engage*

**Interactive/adaptive** – Students apply their knowledge and skills to a problem or scenario and adapt their approach in the light of feedback or evidence - *Explore, Experiment, Trial, Improve, Model, Simulate*

**Assessment** – Students demonstrate their knowledge, skills and understanding and receive feedback from tutors or peers - *Write, Present, Report, Demonstrate, Critique, Peer-review, Self-assess, Receive feedback*

Box 1: Types of Activity for participants of the MOOC

Analysis of the TESS-India MOOC shows that a range of activities are presented, with the emphasis on ‘productive’ and ‘collaborative’. This is shown in Figure 2.

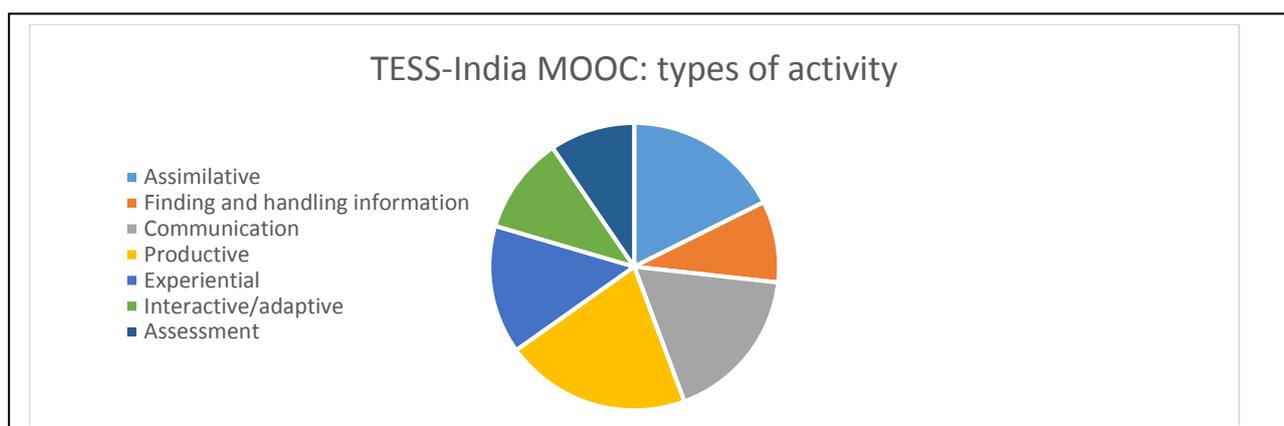


Figure 2: Analysis of the TESS-India MOOC in terms of the proportion of the time recommended for each type of activity.

The analysis is based on the amount of time that participants were recommended to spend on each activity; a significant difference between this type of learning and face-to-face

directed learning is that participants can choose how they spend their time, concentrating on the aspects of the course most relevant to their situation.

In the 'productive' activities, participants undertook a task in which they produced a plan, a presentation or a handout which they could use directly in their work with teachers. 'Collaboration' was through the course discussions. A conventional university course would expect a greater proportion of the time to be spent on 'assimilative' or 'finding and handling information' type activities.

### Support

Support was provided through course discussions, but also through the weekly face-to-face classes and informal groups on social media. What's App and Google plus proved to be very popular, and some groups have continued beyond the life of the MOOC.

Course facilitators from the Open University interacted with participants through the course discussions, responding to technical queries and questions about the content. Weekly messages addressed issues that had been raised and attention was paid to the concerns of participants. For example, deadlines for the completion of the assignments were adjusted when it became apparent that local elections were causing difficulties as participants were involved in an official capacity.

Contact classes were arranged in the seven target states by State Centre for Education, Research and Training (SCERT) officials, but also within specific organisations (such as Universities or District Institutes for Education and Training (DIETs)). During these classes participants had the opportunity to access the internet and work together on course activities, or to discuss issues that had arisen, or to get help. During the main presentation of the MOOC (Nov 2015-Jan 2016) Over 500 contact classes took place, run by 132 facilitators.

A number of groups were formed on social media, where aspects of the course continued to be discussed. These included, 13 'What's App' groups and groups on FaceBook and Google+.

### Resource implications

The MOOC was developed by a team at The Open University, with input from UK and Indian academics, and presented on the EdX platform, chosen because of their commitment to open content and the functionality provided. Critical reading was carried out in the UK and in India and modifications to the content were made after the pilot. These were relatively small changes which involved increasing the number of assessments (as these were found to be motivating) and providing clearer explanations for some of the activities. It was financed by a grant from the Department for International Development (UK Aid).

The content of the course is still available as open content and could be used by any institution for professional development purposes, so it represents investment for sustainability.

## How the MOOC was experienced

The TESS-India MOOC achieved a completion rate of 51%. This translates into 5257 people, most of whom were based in India, and is usually high for MOOCs (average completion rates are around 12% (Perna, L.;Ruby, A.;Boruch, R.F.;Wang, N.;Ahmad, S.;Evans, C., 2014).

Tables 1 and 2 present some of the data concerning the participants.

Table 1: Enrolment and completion

Enrolment number	10236
Number from India (%)	8586 (84% of the total)
Completion number	5257 (51% of those who registered)

Table 2: Participant data from the pre-course survey (7705 responses)

Gender split	45.1% female 54.8% Male Female: 4512 Male: 5480
Age	32- Median Student Age 30.2% - Students 25 and Under 40.2% - Students 26 to 40 29.6% - Students 41 and Over
How many countries (global south)	135 total 73 from Global south
Location	Rural/semi-rural – 2381 – 38% City/urban/semi-urban – 3643 – 58%

Of those who completed the pre-course survey, over 4,400 were teachers, teacher educators and trainee teachers, and over 5,800 participants had never done a MOOC before. The figures show an encouraging gender breakdown as well as good levels of participation from people in rural and semi-rural communities who traditionally have less access to professional development.

Some of the comments from surveys demonstrate the impact that the MOOC has made and the relevance of the learning activities that participants are asked to undertake:

*The activity related to promoting activity learning is very much useful for me. I have also applied few concept in my teaching-learning process and get success.* (Participant from Week 2 (focus: Active learning) of the pilot)

*Before joining this course, I was expecting my class to be silent but later i felt it was completely a passive learning. Now by adopting these new practices as a part of active learning I as well as my students both are enjoying and paying more attention. They are involving themselves to learn something new, showing their curiosity, etc.* (Participant from Week 2 (focus: Active learning) of the pilot)

*It was very nice to know different kind of activities that i can use in my classroom.* (Participant from Week 4 (focus: TESS-India OER) of the pilot)

*The activities will help the participants in identifying learning needs of learners, how to adapt materials to suit the needs of learners. These activities will enhance the skills of the participants. (Participants from Week 5 (Focus: OER) of the pilot).*

Two case studies, also demonstrate the impact of the MOOC.

In case study 1 shows how authentic learning design motivated one of the participants and case study 2 shows how one facilitator was able to motivate participants in her local area.

**Case Study 1: Young male lecturer at a DIET near Lucknow.** He was asked by the DIET principal to take part in the MOOC in November 2016. He was unfamiliar with online learning and not very enthusiastic. In Weeks 1 and 2 he completed the assignments in the contact classes. In Week 3 he was introduced to the videos and realised the potential of these materials. He went back and completed all the activities in Weeks 1 and 2 and found himself really looking forward to logging on. By the end he was really excited by what he had learnt and was using the OER in his own teaching. He even decided to buy himself a laptop and a dongle.

**Case Study 2: Female lecturer in a DIET near Bangalore.** Having previously worked as a Headteacher for 12 years, she completed the pilot MOOC and became a Facilitator for the main MOOC in November, running classes in her own DIET. Such was her enthusiasm for the MOOC, she took it upon herself to support other DIETs, travelling every week to four different locations. Under her guidance, 57 people completed the MOOC. She is currently involved in revising the curriculum in her own DIET and to incorporate the TESS-India Maths OER.

## What have we learnt about MOOCs and educational development

The TESS-India MOOC was highly successful, both in terms of the numbers of participants who completed the course, but also in terms of the enthusiasm and interest that it generated. We are still analysing the data in order to understand the true impact of the MOOC, but for the purposes of this paper, we have demonstrated the potential for this form of learning. A key output was the increase in levels of digital literacy with a number of reports being received of people being inspired to purchase a laptop or a smart phone in order to take part. This is illustrated by a quote from a participant during week 2 of the pilot study:

*'Since this was for the first time that I used the NET independently I was very much exited. I REALLY ENJOYED IT.'*

The evidence we have collected so far suggests that the following were important in securing a high completion rate.

- Face-to-face contact classes. 500 classes took place, run by 132 facilitators. Weekly reports from State Representatives made it clear that these had a significant impact on motivating participants to complete the course. (Bulger, M.; Bright, J.; Cobo, C., 2015) studied the impact of face-to-face meetings as part of MOOCs and

confirm that these meetings ‘filled a gap’ (p1213) for participants. (See case study 1 and 2).

- The importance of learning design. The activities engaged participants and were relevant to their professional role. They did not feel over-burdened. The enthusiasm of the MOOC alumni is reflected in the fact that over 100 of 300 completers during the pilot, went on to become facilitators for the main MOOC. (See case study 2).
- Internet connectivity. This was expected to present a greater challenge than it did. The relatively modest commitment in terms of time, alongside contact classes in which participants had access to the internet, meant that this was less of a problem than anticipated. People were able to complete the MOOC on their mobile phone, tablet or laptop.
- During the MOOC, a considerable appetite for online learning emerged. 5800 participants had never done a MOOC before and the novelty value of the MOOC contributed to its success.
- Frequent assessments. After the pilot the number of assessments was increased from 4 to 6 because these were found to be motivating, and not onerous. Instant feedback was provided in the quizzes and the two peer-reviewed activities generated considerable interest.

## A TESSA MOOC

The TESS-India MOOC has illustrated the potential for this form of learning, and the intention is to design and run a similar MOOC in Africa. However, a key aspect of the impact that TESSA has made thus far has been the cultural relevance of the OER, and a MOOC must be designed for African agendas and structures. A key policy initiative across Africa at present is the integration of ICT into teaching and learning. To do this effectively requires teachers to adopt student-centred approaches to learning and the TESSA activities and case studies are very relevant in this respect. The intention therefore, is to take the learning from the TESS-India MOOC but to design one for Africa that will support the current agenda.

We have learnt that:

- Face-to-face support is very helpful in terms of increasing completion rates, but also in building local communities of practice. This requires local partners – colleges of education, universities, District education offices, NGOs and Government agencies concerned with teacher development.
- Activities must be relevant to the target audience and support them in their professional role.
- Activities must be designed for low band widths. If video is used, for example, it should be outside the MOOC.
- Certification is a good motivator. It can be used by institutions to encourage groups of staff to work together to complete the MOOC, either to give their own certificate or to provide appropriate recognition for the official course certificate

- 6 weeks of study with 4-6 hours a week is realistic, whilst giving enough time for meaningful learning.

For The Open University the key challenge in this context is to build a network of local partners who would be willing to support the MOOC by providing face-to-face classes while the MOOC is running. This will involve engaging in dialogue with a wide range of stakeholders and persuading them that the MOOC will support individual as well as national agendas. If we are successful in this endeavour then the evidence from India is that the rewards in terms of engagement in new ways of learning will be considerable. We believe this will be an effective way to deliver a substantial part of the TESSA strategy, and thus contribute to the Sustainable Development Goals.

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