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Extending the MOOC footprint; supporting capacity building in India

Introduction

The need to improve elementary and secondary school classroom practices across India to raise standards of student achievement is well documented (Beatty & Pritchett, 2012; NCFTE, 2009), and transformation of pedagogic practice in the school system is the overarching objective of the innovative TESS-India teacher development programme (Teacher Education through School based Support)[1]. The scale and urgency of the challenge is argued to demand new approaches to teacher professional learning; traditional residential courses and conventional cascade models have not resulted in high quality learning for either teachers or their students (Wolfenden, 2015). The TESS-India response is to situate teacher learning within school classrooms. This is made possible at scale through the use of Open Educational Resources (OER) and mobile, often locally owned, technology such as low cost tablets and phones. TESS-India has created a large bank of original OER adapted (linguistically and culturally) for the local context of each of the seven project states; Assam, Bihar, Karnataka, Madhya Pradesh, Odisha, Utter Pradesh and West Bengal. Movement in teachers' practice arises from teacher classroom enactment of the pedagogy modelled in the OER, and subsequent reflection prompted by the OER and supported by local experts and peers. To date over 800,000 educators have engaged with the TESS-India OER through a variety of modes and formats: formal accredited courses; informal learning episodes organized by local teacher educators; self-study, accessing the OER directly from the web or offline from SD cards.

But teachers do not work in isolation, and sustainable shifts in the classroom practices of school teachers will only be achieved if there are also changes in the practices of the teacher educators with whom they work (Wolfenden & Murphy, 2015). In India teacher educators are a large, diverse and geographically dispersed group which includes DIET educators (District Institutes of Education and Training), Block Resource Persons (BRPs), Cluster Resource Coordinators (CRCCs) and Headteachers. Often highly academically qualified, they generally lack practical skills in supporting teachers to enact the participatory pedagogy espoused in policy (NCFTE, 2009) and many have few opportunities to support their own professional learning. Engaging with these teacher educators across the seven states was critical for TESS-India success but posed a challenge.

In response TESS-India proposed a capacity building MOOC[2] specifically designed to support implementation of the programme. The MOOC objectives embraced both familiarizing teacher educators with the TESS-India OER and their embedded pedagogy and, crucially, empowering teacher educators to make decisions on when and how to use the TESS-India OER in their work with teachers. Following a pilot iteration the TESS-India MOOC was modified and run on the EdX platform for 6 weeks starting in November 2015. It attracted over 10,000 registrations and 51% of participants completed the course – 81% of completers were from TESS-India states.

MOOCs have been designed and used for multiple purposes including professional learning, support for inclusion, pedagogic development and to enhance brand awareness (Czerniwwicz et al, 2014) but there are few examples of MOOCs being deployed for targeted capacity building within a development initiative. The 'Ebola in Context' MOOC[3] produced by the London School of Hygiene and Tropical Medicine brought together researchers, health professionals and emergency response workers to develop professional capacity in the West African Ebola crisis, but this was a free-standing learning episode rather than integral to a specific initiative.

In this paper we discuss how key design features of the TESS-India MOOC supported project objectives, the impact of these features on participant experiences and the implications for future use of MOOCs in this way.

Design of the TESS-India MOOC

Across India, as in many other contexts, cascade models dominant mechanism for reaching large numbers of professionals. TESS-India aimed to disrupt this; cascade models have limited efficacy and perpetuate

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[1] TESS-India is a UK –India partnership programme funded by UKAid. www.tess-india.edu.in

[2] TESS-India MOOC https://www.edx.org/course/enhancing-teacher-education-through-oer-oecx-tess101x-0

[3] https://www.futurelearn.com/courses/ebola-in-context

hierarchies of professionals with front-line workers – teachers and teacher educators, receiving training after mediation by those more distant from the point at which the problem is greatest (Elmore, 1980). A MOOC, with its ability to enrol concurrently very large numbers of learners, has the potential to make available access to equitable learning experiences for participants across systems and locations.

MOOCs are not new to India; large numbers of Indian participants have engaged with MOOC offerings from global platforms, and an emerging set of local MOOCs being deployed to support professional training (Alcorn et al, 2015). Evidence suggests many Indian MOOC participants are students enrolled in traditional university programmes who use MOOC study to augment their campus experience. Alcorn and colleagues (2015, p.46-47) describe Indian MOOC students as predominately male (~80%), average age 26, working in the IT, business or management sectors (58%) and based in the largest cities. The TESS-India MOOC cohort is very different in demographics, location and motivation.

Positioning the TESS-India MOOC within a development initiative exerted a particular pressure on the MOOC course team, a target for MOOC completers was set by the funder. However, not only are innovations known to take hold in a small fraction of cases (Elmore, 1999) but, in addition general patterns of MOOC participation indicate that a relatively low proportion of people registering actually complete their MOOC study - 'a funnel of participation' (Clow, 2013, p3). Global average MOOC completion figures indicated the project would need to recruit at least eight times the target completion number (Jordan, 2015) but such high levels of attrition (~90%) would have been unacceptable to the MOOC sponsors on the ground, the state governments. Hence there was an imperative to achieve a robust participant completion rate that exceeded global norms.

The size of the TESS-India MOOC was subject to much deliberation. Evidence suggests 4 weeks as the optimal length, but most drop out is in the first two weeks (Jordan, 2015; Perna et al, 2014) so in view of the context and perceived importance of support, a six week course was chosen to enable scheduling of at least 3 face –to-face classes in each location (Safford & Stinton, 2016). We were also cognizant that almost all participants would be in full time employment and MOOC study was designed to occupy no more than 4-6 hours each week.

Key features

Contextually appropriate: Project states (excluding Karnataka) have relatively low levels of educational achievement, high levels of poverty and weak infrastructure. Project surveys and interviews with sample groups of teacher educators – our core participants, generated background data on their characteristics and the facilities available to them within these contexts. This informed design and delivery of the pilot MOOC run in mid 2015 with approx. 200 participants drawn from the project states. Data from pre and post course surveys in this pilot then informed modifications for large scale delivery at the end of 2015; for example participants wanted a weekly assessment task and simplifications to some of the language and terms. A large percentage of the pilot group reported little prior experience of online learning and far from ubiquitous internet connectivity despite high levels of smart phone ownership.

In recognition of bandwidth constraints no videos were employed for teaching within the MOOC and the number of external links was minimized. An awareness of the limitations of the devices used to access the MOOC also influenced design, for example webpages had a maximum word limit and were presented to work effectively on small screens. Only one learning space was formally utilized (EdX platform) to reduce the potential for information overload and a clear learning path signposted through the activities. Finally in line with the project philosophy an open-source platform was selected and all content open licenced to support dissemination, sustainability and to offer future partners flexibility to adapt the content.

Pedagogy and Assessment: Project data suggested most teacher educators were familiar with the theory of learner-centred pedagogy but had little practical experience of this approach; their personal learning experiences were within highly didactic settings and lectures dominated their own teaching. Thus it was essential that the MOOC modelled for teacher educators the pedagogy of the OER, engaging them as active contributors in a culture of participation and enabling them to experience the giving and seeking of support (Edwards, 2005).

A task oriented design was adopted; each week's study centred on learning activities rooted in the local context, reflecting authentic challenges faced by teacher educators and which aimed to be personally meaningful and rewarding for participants (Fischer, 2014). Activities involving 'communication' – posting responding on forums in response to specific questions, consulting colleagues or giving and receiving feedback occupied a similar proportion of study time. Reflection was a key element with participants being encouraged to draw on

and make sense of their experience each week. Expected learning time was given for each activity and the distribution of different types of activities is shown in Figure 1.
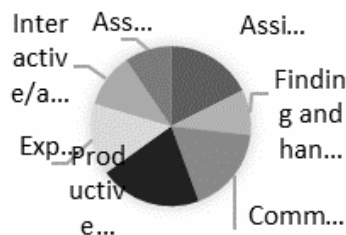

Figure 1: TESS-India MOOC distribution of activity type (drawing on Rienties et al,2015)

The range of possible assessment tasks was constrained by the affordances of the platform; the use of quizzes tends to dominate assessment in MOOCs and whilst these are useful in monitoring progress, we wanted to employ more dialogic forms of assessment reflecting the overall pedagogic approach. Thus MOOC assessment tasks incorporated forum contributions and peer reviewed tasks alongside quizzes. The peer review tasks required participants to compose a 200 word response to a structured task: for example how they would use a TESS-India OER with teachers. On submitting their response a participant then received responses from two other participants and was asked to compose and send peer comment on each response (50 -100 words). Responses were allocated randomly as they were submitted. Participants who successfully completed all assessment tasks (6) and answered the pre-course questionnaire were eligible for a Certificate of Completion

Support: Knowledge of the participants and previous experience indicated that particular attention should be paid to the forms of support offered to participants. We opted for a blended support model. Within the MOOC platform support is available from peers and facilitators through the course forums, feedback on the peer reviewed assignments and the framing of the activities themselves. But much of this interaction is asynchronous and voluntary. To complement this, participants in project states were allocated to contact classes, meeting weekly or fortnightly throughout the MOOC. Contact classes served a dual purpose - enabling participants to study as part of a group in a more synchronized fashion (Li et al, 2014) and offering online study facilities for participants without personal access to a pc or the internet. Each class was led by a local facilitator – educators who had successfully completed the earlier pilot MOOC. Extensive facilitator guidance[4] and training was provided and during MOOC delivery facilitators received weekly EdX student data for their class to inform planning of the contact sessions (Slade and Prinsloo 2015).

Blended models of MOOC study are not uncommon but our model is unusual in two ways; firstly the MOOC was not offered within a formal programme at a campus based institution to augment or provide part of an existing course (Cutrell et al, 2015; Sandeen, 2013). Secondly, contact classes were organised and quality assured by the project rather than being purely user initiated and supported.

The Study – what enabled participant engagement and completion?

Methodology

Data sample: Enrolment was open to a global audience and MOOC registrations came from 135 countries including 73 'global south' countries. In each project state the TESS-India team worked closely with state agencies such as the SCERT (State Council for Education, Research and Training), to encourage enrolment amongst the relevant constituency of teacher educators and other teaching professionals and 95% participants were from India. The MOOC was aimed primarily at teacher educators but in several states key stakeholders were keen for headteachers, teachers and trainee teachers to participate alongside teacher educators. Over 90% of participants who completed the pre-course survey described themselves as part of this wider group.

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[4] http://www.open.edu/openlearnworks/course/index.php?categoryid=45

Data generation: This paper draws on multiple sources of data including MOOC platform data. In addition participants were requested to complete a pre-course survey (approximately 6200 responses) asking about expectations and motivations for undertaking the MOOC together with demographic data - country of residence, age range, gender, prior academic and professional qualifications, and type and location of employment. A post –course survey was also offered but not mandatory (approximately 2500 responses) and focussed on participant MOOC experiences. Both surveys comprised mainly closed –questions and were completed online, frequently during contact classes. A sample of contact classes in each project state was monitored by state officials using a structured observation schedule to record the kinds of activities and approach of the facilitator. Finally each project state team completed regular reports on the running of the MOOC. Participants were made aware of the possible uses of the data and asked for their consent to its use.

Data analysis: Data from the pre- and post-surveys were merged and combined with information about course completion and certificate eligibility. Records were anonymised and then analysed using SPSS v.21. There remain a limited number of cases in which students gave a different identifying email addresses in the pre- and post-surveys. These cases were excluded from analysis that involved both pre- and post-survey data.

Findings and commentary

The participants: There were 10, 236 registered participants on the TESS-India MOOC. Approximately 60% responded to the pre-course survey and, of this group, over 40% also responded to the post-course survey. In all but one district there was no significant difference in the proportion of women and men who responded only to the first survey and to both surveys. The exception was Madhya Pradesh where proportionally fewer men compared to women competed both the pre- and post-surveys. As would be expected from educators, participants were well qualified academically (almost half had a Masters degree or other post-graduate teaching certificate or diploma), but in many other respects did not confirm to the common profile of a MOOC user in India (Alcorn et al, 2015). Overall almost 45% of the participants were women, 30% of participants were over 44 years old and 39% of participants described their work location as rural or semi-rural. Over 90% of participants who responded to the pre-course survey indicated that this was their first experience of a MOOC, for many their first experience of online learning, and for a few their first serious engagement with computers. MOOC completion was measured by eligibility for a Certificate of Completion and 51% of the enrolled participants completed the MOOC, of which 81% (4229) were known to be from the project states. There was no discernible difference in completion rates (as measured by eligibility for a Certificate of Completion) between those living in city (75% were eligible), rural (75%) and urban (78%) locations. However, those living in locations described as 'semi-urban' and 'semi-rural' showed a slightly higher rate of completion (85%).

Access: In the post – MOOC survey 57% of respondents described the MOOC as 'very easy to use', a slightly lower percentage than for professional usefulness and overall course experience. Further investigation indicates that several factors may have limited easy of use; firstly, language of instruction. The MOOC was in English and for many participants this is not the language of their workplace, community or home (27% of participants in Bihar reported challenges in studying in English medium).   In two states participants took action to improve linguistic access, collectively creating their own Hindi translation of the MOOC and distributing this, on paper, through contact classes. Some participants first shared their comments and feedback offline in Hindi and then collaboratively translated into English before posting online.

Power supply, computer access and connectivity were considerable issues for many participants and caused some participants to withdraw from the MOOC. Individual access to a computer was rare in contact classes, even in venues with functioning facilities often only one or two laptops served the entire class. But participants and facilitators responded creatively: in venues without electricity facilitators used printed copies of the MOOC pages; some facilitators acquired internet 'dongles' with multiple sim cards for different networks to maximise connectivity during the contact classes; others carried laptops to the classes – in rural Bihar a facilitator took access to his participants, driving to schools and BRCs with his own laptop and dongle; a number of participants invested their own funds to purchase smart phones and laptops or to buy credit for their personal mobiles, others visited internet cafes.

Support: Over the duration of the MOOC 590 contact classes were offered across the seven project states and participants in these states who completed the MOOC attended an average of over 5 classes (5.8). Contact class numbers ranged from 5 to 110, with an average of 37 participants, and lasted between 90 mins and 3 hours. They were perceived to play a crucial role in MOOC engagement, as a Bihar facilitator commented, 'Contact

class has been the backbone of the MOOC' and completion rates for participants in locations with contact classes were very high as the following figures illustrate.

STATE with contact classes	Number who responded to the Pre-MOOC survey indicating their location	% Completion of those who responded to the Pre-MOOC survey
Assam	148	87 %
Bihar	817	80%
Karnataka	448	82%
Madhya Pradesh	1379	60%
Odisha	1261	91%
Uttar Pradesh	1192	81%
West Bengal	152	83%

Table 1: Completion rates for participants in project states

Facilitators were often undertaking this role for the first time and many took personal pride in supporting completion in their group, contacting participants individually and posting updates and photographs online following each class. Analysis of survey responses show weak to medium correlations between overall satisfaction with the MOOC and a range of indicators relating to in-class facilitator support, receiving helpful feedback and the value of attending classes for motivation and discussing online content with others. But the financial and time costs for travel to the contact classes limited attendance for some participants and caused them to withdraw.

Participants also supported each other through MOOC forums and assignment feedback. The post-course questionnaire shows that most participants who completed the MOOC had had previous experience of providing peer feedback (86.2%) although only 14.7% did this 'quite often.' Almost all respondents (96.3%) said that during the MOOC they provided peer feedback at least once which means that for around 10% of participants, the MOOC may have provided their first opportunity in delivering peer feedback to colleagues. This is not to say, however, that participants did not find the activity challenging: 23.4% admitted to finding it 'very challenging' and 39.3% found it 'challenging.' No statistically significant differences at the p=.05 level were found between men and women in respect to their participation in providing peer feedback during the MOOC or the degree of challenge this presented. On occasions participants were disappointed by the brevity of the peer feedback they received despite guidance being provided and an unanticipated challenge arose when participants received peer feedback in an unfamiliar language.

During the MOOC delivery a third strand of participant generated support emerged. This took multiple forms, for example in Assam a DIET Principal recruited a 'computer friendly person' from the community to provide support for himself and members of his staff. In several states facilitators and / or participants utilised social media, creating WhatsApp, Facebook, Share-it and Google groups. Many of these groups were 'invisible' to the project team but we are aware of at least 13 WhatsApp groups in which participants were reminding each other of deadlines, class times, sharing ideas and asking for advice. In some cases these peer networks and communities have survived 'post- MOOC. The support model for the MOOC as experienced by participants is represented in figure 2 below:
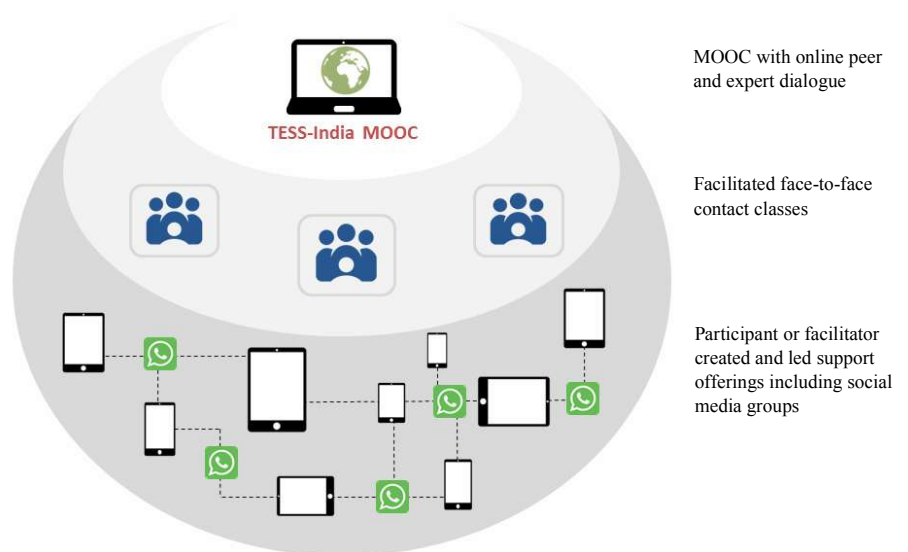
MOOC with online peer and expert dialogue

Facilitated face-to-face contact classes

Participant or facilitator created and led support offerings including social media groups

Figure 2: TESS-India MOOC support model.

Perception of personal value and learning: Feedback from contact classes indicated that a number of participants struggled in the first two weeks; the notion of online study was novel and many were not convinced it was relevant to their work. But across the states this changed when participants successfully completed the assignments in weeks 1 and 2 and encountered the TESS-India video OER in week 3. As one facilitator commented 'after each weeks' work their confidence in doing the course would increase and they would in turn become more engaged in it' (Facilitator, Bangalore).

Those participants who completed the MOOC reported overwhelmingly positive experiences, for example 73% described their overall MOOC experience as very good and 23% as good meaning that 96% rated their MOOC experience as either very good or good. Almost all respondents reported that the MOOC was very useful or useful (96%) to their professional activities and had helped to improve the effectiveness of their teaching (98%). One particularly strong correlation was between satisfaction with the MOOC and usefulness for professional learning. Project reports substantiate this, 'participants are finding the course interesting and meaningful to their own situation' (Assam MOOC Report). Just under half of those who responded to the pre-course survey listed gaining a Certification of Completion as a 'main reason' for taking part in the MOOC. Historical ways of recognising learning within a highly hierarchical system may have accorded value to the Certificate of Completion.

A theme through all participant feedback was an appreciation of the value of exchanging ideas with their peers, a new or seldom practised experience for many which was reported to enhance understanding of the OER and participatory pedagogy. The MOOC attempted to position all participants as having something of value to contribute and as one participant commented 'the MOOC has promoted peer learning and support without any competition and encourages collaborative learning'. Movement towards more participatory ways of teaching and learning is ongoing and long term but there is evidence that the MOOC experience began to challenge participants' previous views that teacher-created material is always of higher value than peer or student generated contributions and that learning is restricted to knowledge of specific facts. Whilst the TESS-India focus was on project implementation in India, the open global nature of the MOOC was important; participants reported appreciating reading different points of view from peers in other countries.

A key learning outcome for participants was developing competence and confidence in using technology, 'I had very limited knowledge about computers and no knowledge about internet. I was afraid if I will be able to do

this course. But I got registered and now I have completed the MOOC and I am feeling very proud' (teacher, Odisha) and 'this MOOC has eradicated their myth of not being able to pursue and complete an online course' (facilitator, Bihar). The MOOC experience has stimulated further interest in online study with reports of participants subsequently engaging in online courses and MOOCs.

The goal of this study was to understand more about participants' engagement with the MOOC. Much of the data is from participants who successfully completed the MOOC and we have little data on those who opted out at various points during the six weeks. But given the relatively high percentage of participants who completed we suggest experiences reported here are helpful in designing and delivering similar MOOCs.

Concluding thoughts

The TESS-India MOOC offered an innovative way to support professional development within a large scale change project, disrupting traditional cascade models. Utilising a MOOC in this way for learning of specific professional skills promoted a democratic approach in which all participants have space to contribute, congruent with the pedagogies advocated in policy. It developed a collective sense of shared endeavour for participants and was highly cost efficient. Research identifies key constraints on MOOC uptake and completion in developing countries as including; awareness of MOOCs; access to IT infrastructure; relevance to country context; perception of personal value and personal factors (Alcorn et al, 2015; Pompe, nd). These were relevant here but we suggest 'support for study' is also critical.

We attribute success - in terms of participant completion, to a blend of the digital and physical learning spaces which help collapse the global and the local. Project designed attributes such as the authenticity of the study and assessment tasks, the provision of contact classes with trained facilitators and consideration of technology access, combined with local adaptations initiated by participants to meet particular contextual needs. Imaginative user owned solutions were found to overcome infrastructure and access challenges and tools, such as social media, harnessed by participants in self-generated support groups. Through the combination of the MOOC platform, contact classes and social media, the MOOC bridged local and distributed learning, creating a hybrid space focussed on a shared 'domain of practice' (Wenger, 1998) in which participants could begin to 'learn to be' (Brown, 2005).

There has been much scepticism about the usefulness of MOOCs to support sustainable development. The relative success of the TESS-India MOOC indicates MOOCs have potential in less economically developed contexts to target skills and capabilities of specific groups of professionals. But success demands carefully attention to the provision of an enabling structure which opens possibilities for participants to generate their own solutions to issues of access and support, alongside what is formerly provided. Creating such spaces for experimentation and innovation is not always easy, particularly in a context where historically flows of information and learner activity have been highly monitored and controlled. We are now engaged in widening access through the creation of a Hindi medium derivative of the TESS-India MOOC to be offered in late 2016 and we look forward to studying these participants' experiences.

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