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TESS-India OER: Collaborative practices to improve teacher education

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TESS-India OER: Collaborative practices to improve teacher education

Abstract

As the numbers of children attending school in India rises rapidly ensuring a productive learning experience for every student is a huge challenge. Quality is central to the Government of India's education policy; major education goals recognise that changes in teachers' classroom practice are critical to improving students' learning in elementary and secondary schools across India. This paper describes the rationale and pedagogy of an innovative response to these challenges harnessing contemporary ideas on 'open', learning and the increasing availability of network technology in the form of a multilingual Open Educational Resources (OER) teacher education toolkit. The main section of the paper then describes the processes for multi-stakeholder participation in the development of the elements of the OER toolkit and the paper concludes with a discussion of the 'open' dimension of the project and how this enables 'local' authentication and mediation of use of the OER in each of the project states.

Introduction

Investing in teachers is acknowledged to be essential to improve the quality of education across the world (UNESCO, 2014). Most recently this has been recognised internationally in target 4c of the Sustainable Development Goals which calls for an increase in the supply of qualified teachers (UN, 2015). But the form of investment in teacher development and where it might be focussed within education systems to support education transformation are complex issues for national and local stakeholders. Globally education policy is dominated by a belief that learner-centred approaches to teaching and learning will enhance students' experiences in schools (Schweisfurth, 2013) and India is no exception. Indian Government policy is particularly ambitious and visionary in terms of the implementation of active pedagogies, however ten years after the publication of the NCF2005 there is much still to be done to make the child centred classrooms described so vividly in the NCFTE2009 a reality for all children across India (NCF 2005, NCFTE 2009).

This paper analyses how TESS-India (Teacher Education through School Support in India)¹, a UK-India partnership investment, is harnessing online technologies, research on learning and contemporary thinking on open development to create an innovative Open Educational Resources (OER) teacher education toolkit in support of improvements in the classroom practices of teachers in multiple contexts across India. The paper outlines the rationale for the initiative and the problems of practice which it is addressing before describing the main features of the project and how they support movements of practice through a participatory

¹ www.tess-india.edu.in

pedagogy. The paper concludes with a discussion of the ‘open’ dimension of the project and how this enables ‘local’ authentication and mediation of use of the OER in each of the project states.

TESS-India was initiated in 2012 at the bequest of the Government of India to help address the issue of teacher quality. As increasing numbers of children across India attend school, the challenge is to ensure a productive learning experience for each child. Recent data indicates large numbers of children achieve poor learning gains for each year in school (ASER, 2015). Changes in classroom practice are acknowledged to be critical to improving these children’s learning and targeting teacher training is a significant goal of the Government of India (GoI, 2013). TESS-India offers a pioneering teacher education response to these challenges with its multilingual Open Educational Resources (OER) toolkit comprising text and video materials in multiple formats to support the professional practice-based learning of primary and secondary teachers of literacy, maths, English and science. Through harnessing the attributes of ‘open’ in both the outputs – OER - and in its ways of working, TESS-India can be argued to be part of the emerging ‘open development space’ (Reilly & Smith, 2014). Collaborative peer production under a diffuse and contextual structure gives rise to multiple products (OER) with distributed ownership and an absence of commodification.

TESS-India is funded by UKAid as a multiple stakeholder partnership led by the Open University, UK working with the Ministry of Human Resource Development (MHRD) and Departments of Education in seven states across India². Collaboration is central to the TESS-India model and over 200 Indian and international teacher education experts, policy makers and teachers were involved in the creation and adaptation of the OER and large numbers of Indian teacher educators are now incorporating the OER into their pre-service and in-service teacher education programmes, aiming to sustainably strengthen and improve systems at relatively low cost.

The context

Quality has long been central to education policy in India and the Twelfth plan (2012-2017) continues this theme, ‘The four main priorities for education policy have been access, equity, quality and governance. The Twelfth Plan will continue to prioritise these four areas, but will place the greatest emphasis on improving learning outcomes at all levels’. (GoI, 2013,

² In this first phase TESS-India is working in Assam, Bihar, Karnataka, Madhya Pradesh, Odisha, Uttar Pradesh and West Bengal.

21.14). The approach to quality is holistic embracing not only structural and physical school inputs but systems in teaching and learning including building the capacity of teachers to ensure that ‘every child must be in school and learning well’ (GoI, 2013,21.36) Recent Indian education policy has articulated a position for teachers as reflective, empowered, professional practitioners working within a constructivist orientation. In positioning students as knowledgeable, problem solvers and self-directed, policy draws on both global discourses and the Indian child-centred tradition in which the teacher’s expertise and skills are used to guide the child appropriately (NCF, 2005; NCFTE, 2009; RtE, 2009; Saigal, 2012; Guthrie et al, 2015, Smail, 2014). A framework for Teacher Education reform to support movement to this new participatory pedagogic position was extensively detailed in the 2009 National Curriculum Framework for Teacher Education (NCFTE) and subsequently there have been a number of implementation initiatives at national and state level.

Compared to many countries the structures for teacher education in India are comprehensive, de-centralised and wide-spread although complex and at tremendous scale – in 2014 over 1.1 million teachers gained qualifications from 13,000 teacher education institutions (MHRD, 2015). For elementary teachers the networks of Block Resource Centres and linked Cluster Resource Centres at district level provide a cadre of local teacher educators to support in-service teacher development, complementing and extending the provision of the district institutes of education and training (DIETS). Structures for developing the professional capabilities and skills of secondary school teachers are still emerging but both elementary and secondary teachers are entitled to a number of days of professional development each year; the allowance for elementary teachers whilst recently reduced, is still generous by international standards (MHRD, 2015). Each year targeted initiatives are designed to offer professional development opportunities for classroom teachers, such as the Learning Enhancement Programme (LEP) under the Sarva Shiksha Abhiyan (SSA) for elementary teachers and the ‘Orientation of secondary school teachers’ in the Annual Work Plan and Budget 2015/16 for Rashtriya Madhyamik Shiksha Abhiyan (RMSA) (GoI, 2014)

But despite these structures, initiatives and the official discourse of ‘child -centred’ learning, a series of government reviews such as the Justice Verma Review 2012 and Joint Review Missions for Teacher Education catalogue serious deficiencies and challenges within the system; little change is observed in classroom pedagogy and teacher training is not yet seen to be impacting on improved learning outcomes for students (Muralidharan, 2013; MHRD, 2012a –c; MHRD, 2014). Analysis of provision points to a dissonance between policy and enacted pedagogy pervading the system exacerbated by the low importance given to ‘teaching practice’ in teacher education programmes (Banks and Dheram 2013; MHRD, 2012a). Many

programmes are observed to adopt a theory-orientated discipline-based approach where development of disciplinary knowledge is experienced separately from professional training in pedagogy. Programme design assumes that trainee teachers will develop child-centred pedagogic practices from study of learning theories; modelling of the link between these theories and pedagogic approaches in the classroom is absent (NCFTE, 2009). This limits teachers' understanding of a 'child-centred' approach and does not equip new teachers to deal with the complexities of the real classroom situation. Such realities are becoming increasingly multifaceted - multilingual, multigrade classes, large numbers of first generation learners, but there has been slow revision of teacher education curricula to recognise these conditions and to align with the philosophical and epistemological approaches articulated in the NCFTE 2009. Reports note that DIET staff often have limited interaction and only partial knowledge of local schools and their communities (Azim Premji 2010; MHRD, 2013) with the result that frequently the curriculum gives little value to the practitioner knowledge of teachers and the languages and cultures that children bring to school are ignored. In school classrooms an approach characterised by rote-learning and an emphasis on examinations and tests continues to be ubiquitous across the country. Many teachers perceive their role to be limited to delivery of the prescribed content of the text book and the exercise of teacher professional autonomy leading to experimentation and pedagogic innovation is not often observed (MHRD, 2012a -c; Smail, 2014; Sriprakash, 2010; Bose, 2013).

TESS-India and teacher learning

A theme through these reviews and analysis is the persistence and prevalence of classroom practice which does not offer possibilities for productive learning to large numbers of students. It is this condition which is the focus of change in TESS-India. TESS-India places teachers at the heart of classroom renewal arguing that a re-conceptualisation of the role of the teacher and their relationship with their learners - an ontological shift, is crucial for achieving the pedagogic transformation articulated in policy (NCF 2005, NCFTE 2009). TESS-India OER address the observed disconnect between theory and practice by uniquely modelling for teachers, and teacher educators, ways of transacting participatory pedagogy in classrooms through exemplars from the student curriculum. Within the OER attention is also paid to how knowledge and ways of knowing develop and are deployed in new learning situations. The pedagogy of the OER challenges the dominant epistemological position in which knowledge is seen as something objective and external to people and hence acquired through the learning process. Rather knowledge is seen as developing through a constructive process mediated by prior knowledge and personal and community experience. In this way

the OER aim to recast the relationship between what people know and the setting in which they know, 'between the knower and the known' (Putnam & Borko, p12, 2000). Through enactment of the pedagogy modelled in the OER and engaging in reflection informed by evidence of practice, movement in practice for teachers is enabled (Murphy, 2014). Evolution of the policy position over time and location is anticipated through drawing on 'openness as contingency' in the project model (Reilly & Smith, 2014) allowing local mediation of authentication of the OER and differentiated forms of use to meet local needs and structures.

Central to the TESS-India approach is the classroom or lecture hall as the site of teachers' professional learning. Teacher learning is understood as movement forward into practice, into becoming a more competent and effective professional rather than the acquisition of abstract knowledge external to people. To develop as a professional is to become more skilled and enhance one's capabilities with the tools and practices of the profession, and this only becomes meaningful through participation, that is through negotiation and re-negotiation in practice in the classroom or lecture hall (Lave, 1992). Teachers' learning is then inseparable from the learning of their students, they are entwined in a complex multi-faceted dynamic relationship which also includes the artefacts of their surroundings (Bruner, 1996). Learning, in this perspective, is conceptualised as social, jointly constructed with student partners and peers; distributed, shared over the people, activities and artefacts of the environment; and situated – determined by the circumstances in which it occurs and what is made available to learners whether they are teachers or students.

This approach is reified in the TESS-India OER in which the participatory pedagogy is characterised by five key features:

- positioning students as knowledgeable
- eliciting what they know
- the negotiation of meaning to support participation in learning
- structuring of learning opportunities through the creative use of learning resources, and
- developing dialogic interactions – learning from each other.

The OER challenge explicit stratification of students, valuing difference over age, achievement or background thus, for example, teachers are encouraged to respect the language of each child and multilinguality of students becomes part of the pedagogic process as a resource to use for linguistic and cognitive growth (Agnihotri, 2014).

Development of teachers' adaptive expertise, knowing how to act in different circumstances, is a fundamental aim of the TESS-India OER. The OER are not written as a set of instructions where teachers instrumentally apply a set of strategies or detailed 'scripts' in their

classroom. Rather the OER support the development of reflective and discursive identities within teachers by treating them as professionals able to make judgements on their students' learning and encouraging them to engage in ongoing conversations with their practice to generate solutions for their own classrooms. Hence whilst the OER guide teachers to undertake activities drawn from the specified school curriculum with their learners in their classroom, they do not cover the entire school curriculum. Teachers are expected to extend their learning in active participatory practice to other topics within the curriculum in addition to those covered in the OER.

The OER acknowledge the contextual and contingent aspects of schooling. They encourage teacher movement towards greater participatory practices embedded within the culture and realities of teachers' own practice recognising that new pedagogy, and associated classroom practices, is interpreted through teachers' cultural constructs of teaching and learning, their prior experiences of teaching and their attitudes towards and expectations of their students. Teachers are challenged to take responsibility for learning in their own classrooms and empowered to understand the effects and rationale of the participatory pedagogy through ownership of their use of it. Teachers develop their capacity to make a difference in their classrooms.

The TESS-India OER toolkit

Collaboration is central to ways of working in the TESS-India project. The key mechanism for enabling collaboration at all stages of the project is a State Resource Group (SRG) in each of the project states comprising 20 – 30 teacher educators, leading teachers and other key teacher education stakeholders nominated by the relevant state nodal body. They bring a depth of experience and the potential to mediate across levels in the ecosystem of teacher education in each state. Through participation in embedded TESS-India activities – OER writing and refinement, AV preparation and filming, translation and localisation of the OER, SRG members have deepened their understanding of how the TESS- India OER function to support changes in understanding of learning and learners. Thus how SRG members experience these activities is an integral part of the planning for enacting change.

Initial work focussed on identification of needs to inform the shape and size of the OER toolkit. This comprises sets of text and video OER for teachers and school leaders as shown in figure 1:

Teacher development OER :	Elementary English (15)
	Elementary Language and Literacy (15)
	Elementary Maths (15)
	Elementary Science (15)
	Secondary English (15)
	Secondary Maths (15)
	Secondary Science (15)
School Leader OER (20)	
Key Resources (10)	
Video Clips (55)	

Figure 1: TESS-India OER

For the lower secondary phase the focus on Science, Maths and English is in line with the goals of RMSA and priorities for in-service teacher development. At elementary level the subjects reflect the key specialisms of upper primary school teachers whilst recognising the more integrated curriculum of the lower primary classes. A complementary set of OER for headteacher casts the school leader as an ‘enabler’ of teacher and student learning and focusses on developing skills in the leadership of learning at school level.

The Key Resources are integral to the design of TESS-India providing a set of ten themes which support conceptual coherence across the sets of OER. The Key Resources help teachers to make sense of the pedagogy outlined in policy in the context of their classrooms, showing what it means and the new practices that need to be introduced. They offer concise and accessible overviews of classroom approaches and methods including ways of organising students, learning activities, student-student and teacher-student interactions, and identifying, meeting and monitoring student learning needs, complementing the specific details within the subject OER.

- * Planning lessons
- * Involving all
- * Talking for learning
- * Using pair work

- * Using questioning to promote thinking
- * Monitoring and giving feedback
- * Using groupwork
- * Assessing progress and performance
- * Using local resources
- * Storytelling, songs, role play and drama

Figure 2: TESS-India Key Resources

The Key Resources provide an organising framework for the short video clips (55 in total offering over 4 hours of film in each language version) shot in primary and secondary schools in Uttar Pradesh and Madhya Pradesh in collaboration with SRG members and other local teacher educators. They show teachers trying out more learner centred, participatory approaches with their students in authentic contexts. The videos are not intended to demonstrate model practice but to inspire teachers to experiment with similar approaches and techniques in their own classrooms, to provoke conversation amongst teachers and teacher educators and to increase teachers' confidence in enacting ideas from the complementary text OER through evidencing how individual teachers are using new or unfamiliar practices in their own classrooms. Each video has a commentary focussing on *student learning* and how this is enabled by particular aspects of the teacher's practice, serving to model good classroom observation, in particular 'noticing' aspects of student learning that require formative action. Each commentary concludes with an outline of how student learning will be taken forward and raises a question for the viewer, for example prompting consideration of the implication of the activity show in the video to their own practice. Whilst the classroom dialogue is in Hindi SRG members supported creation of multiple language versions of the commentary including a description of key points of the classroom dialogue for those unfamiliar with Hindi.

The basic unit of learning for the teacher is the Teacher Development OER. Each subject set contains 15 individual OER all following the same template explained in figure 3:

What this unit is about	Introduces the teaching approach and the curriculum topic of the unit.
What you can learn in this unit	Learning expectations for the teacher which highlight the key opportunities for learning in the OER (no more than 3 in each unit)

Why this approach is important	This section explains why the teaching approach modelled in the OER is important in supporting productive student learning.
Activity (3 - 5)	Activities to be carried out by the teacher. Most are for the teacher to do in the classroom, with their students, but some involve working collaboratively with colleagues or preparing for classroom activities.
Case study (2 - 4)	These accounts show teachers undertaking the activities described and the actions they take in response to student questions, behaviours and developing understanding.
Pause for thought	Prompts to encourage the teacher to reflect purposefully on their existing practice or experience and what they have noticed when carrying out the activities or studying the case studies.
Narrative	This reinforces the benefits of the approaches and techniques that are the focus of the OER and supports the teacher in developing their learning in different curriculum contexts.
Summary	A brief review of the technique covered in the unit and encouragement to the teacher to take forward their learning, revisiting the ideas in different curriculum contexts.
Resources	Material to support the teacher in carrying out the activities. They may contain more detail about the approach (such as material from one of the key resources), support for subject knowledge development, classroom resources and links to the textbook or further examples of similar classroom activities.
Additional resources	These are intended to empower the teacher by encouraging them to take their learning beyond the OER and engage with other resources that support their developing professional practice. This is an opportunity to raise awareness of high quality resources that are available in India and internationally.
References/ bibliography	References used by the authors and other recommended readings for the teacher to extend their academic understanding of the issues highlighted in the unit.

Figure 3: Components of a TESS-India OER

The OER learning outcomes, addressed to the teacher not students, balance the need to be achievable with recognition of teachers' different starting points for development and varied contexts. At the heart of each OER are the *activities* and accompanying *case studies*. The activities help the teacher to enact practices that position learners as knowledgeable, promote dialogic interactions and provide structured learning experiences that take prior learning into account. Through undertaking the activities existing practices are disrupted and the teacher is supported in developing new understandings about teaching and learning. The case studies derived from field work capture stories and ideas from practising teachers and illuminate particular aspects of classroom interactions, extending teachers' views of the possible (Dyer et al, 2004) A key aim is encourage teachers to attend to the thinking of students by scaffolding teachers through the process of interpreting their students' understanding and making decisions on how to respond on the basis of their students' understandings, an approach congruent with current policy envisioned by Continuous, Comprehensive Evaluation (CCE) in the RtE (2009). Within each OER are a number of prompts to the teacher to reflect on evidence from their own practice and the case studies, through this engagement learning for the teacher is supported.

The TESS-India OER complement the textbook, aimed at supporting student learning, and are distinguished from typical teachers' guides and materials which offer detailed teaching strategies but not support for teacher learning. They are a source of teachers' learning not merely ways to teach particular topics. Use of specific instances from the student curriculum ensures they are relevant to the tasks teachers have to perform and helps to capture teachers' attention – teachers are known to look for aspects of lessons which are familiar to them (Lloyd & Behm, 2005). The OER develop teachers' knowledge and skills but structure teachers' engagement to encourage them to continue to use these 'principles of practice' beyond the specific lesson and topic. They challenge the current often limited role of the teacher, developing teacher professional autonomy through experimentation and creativity.

Alignment with the school curriculum and current initiatives such as CCE is critical for authenticity of the OER alongside recognition of the working conditions of many teachers in India - multi-lingual classes, considerable number of first generation learners, large classes, paucity of educational resources and equipment. The universal availability of text books is acknowledged and these are drawn on in the activities, as are resources from the local community. Development of teachers' subject knowledge, frequently identified as a professional learning priority (Behar, 2015), is integrated through the OER. Similarly activities aiming to improve teachers' confidence and competence with IT in support of

student learning are threaded through the OER harnessing the affordances of readily accessible tools such as the camera facility on a teacher's mobile phone.

The TESS-India toolkit is infinitely adaptable and flexible for use in different cultural and environmental contexts and to meet a range of teacher development needs. Flexibility in the design of the TESS-India OER enables chunks of learning material (OER) to be joined together in multiple ways and integrated with other content; there is not one linear sequence or pathway that must be followed through the OER.

Completed OER were reviewed by an Independent Review Panel (IRP), comprising 16 Indian and international educational experts selected by MHRD. The IRP gave robust approval to the TESS-India OER, judging that they met the quality and appropriateness criteria for dissemination and ongoing development and found much to commend in the way that the OER had been developed (Moon, 2014).

Feedback from instances of OER use has iteratively informed development of the OER and reported promising observable shifts in teachers' practices. In the process of creation of the video clips pairs of teacher educators and teachers were given drafts of the Key Resources and the text OER (in English) on a tablet pc. The tablet offered both a convenient way of storing the library of TESS-India OER, offering the teacher educator ready access to reifications of the participatory pedagogy to use in discussion with the teacher, and also a tool for capturing moments – emergent interactions - in the classroom (through audio, video, text, image) for use in the post-lesson discussion with the teacher and also analysed for research (to be reported in a later paper). The ten themes of the Key Resources were allocated across the teachers, each taking two themes to focus on in their teaching during the production phase. During this 2-3 week period the teacher educator undertook observations of the teacher's classes and engaged in a daily feedback discussion with the teacher. This discussion focussed on specific instances of practice in lessons using the evidence provided by the tablet recordings and explored how the teacher could move to a more participatory pedagogy. The teacher educator used the TESS-India OER to exemplify practice issues with the teacher; activities for future lessons, case studies to illuminate particular points and drawing on the prompts – 'pause for thought' – in their dialogue. Importantly the TESS-India OER also provided a learning resource for the teacher educator helping them to develop their understanding of participatory practices.

Shifts in classroom practices can clearly be seen in the TESS-India video³ and as one of the project team comments when talking about students in a secondary Maths class:

‘secondary level also I saw the students, the way they were questioning their teachers, they had become, they had a comfort level that was never there earlier with the teacher in asking questions, in raising queries and just sharing whatever their thought about the topic.’

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and more generally,

‘When I observed the classroom and also interacted with the students later on, I could really see the changes. The students said that the teachers were never earlier teaching like this and now we are understanding more and we are asking more. So these words really made me confident of the change that I was myself observing.’

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Such comments are not untypical of those from headteachers, local teacher educators and TESS-India authors when supporting teachers in engaging with the activities in the OER.

Capacity building for a larger cohort of teacher educators beyond the SRG in each state is being achieved through the TESS-India MOOC⁴ (Massive Open Online Course). This is an open and free online task-orientated course following a participatory pedagogic model congruent with the pedagogy of the TESS-India OER. Teacher educator participants study for approximately 4 hours a week over a 6 week period engaging in a number of collaborative, interactive tasks and those who successfully submit a small number of assignments are awarded a Certificate of Completion. The first pilot iteration of the TESS-India MOOC was offered in May – July 2015 in English and attracted almost 3000 participants from across the globe in addition to 200 teacher educators sponsored by the TESS-India state partners. This latter group were offered regular face-to-face contact sessions to complement study in the online space and over 80% of this group completed the MOOC. Data from this pilot presentation of the MOOC is currently being analysed to inform a second presentation of the MOOC later in 2015 and will be reported in detail in a further paper.

Being ‘open’

³ https://www.youtube.com/watch?v=naUh7NPi_AE

⁴ <https://www.edx.org/course/enhancing-teacher-education-through-oer-oecx-tess101x>

TESS-India is conceptualised as an ‘open’ project, harnessing ideas about ‘open’ content within an ‘open’ model of project working – a non-hierarchical networked endeavour (Castells, 2010). The project model is not seen as formalised and fixed, to be followed exactly in each project state, but rather as a process which evolves appropriate to particular contexts to enable achievement of project goals. TESS-India leverages the attributes of open content to enable educators to collaborate and practise in new, locally relevant and productive ways. All project content is open in the form of Open Educational Resources. These are defined as ‘teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits free use and re-purposing by others’ (Smith & Casserly, 2006). Under all OER licences users are given rights to free access, to copy and to reshare but many OER (including the TESS-India OER) also grant users the right to adapt, modify and translate the materials for different contexts and purposes thereby adding value to the original OER and creating derivative resources. These properties of OER are central to TESS-India, ‘users are able to become creators and readers become authors’ (Smith, 2014 p 131).

In TESS-India the ‘adapt’ or ‘revise’ facility of OER has been formalised through a highly structured three stage project sponsored localisation process and the OER are now available in 9 versions (generic English and Hindi versions in addition to versions specific to each of the 7 project states) and 6 languages – Hindi, English Assamese, Bengali, Kanada, and Oriya.

In the localisation process lead academics first analysed each OER to identify those sections where localisation was necessary (for example references to specific text books, stories and festivals) and points where localisation might be beneficial to enhance teachers’ engagement with the OER. These were recorded on a series of detailed grids for review by the relevant subject experts of each TESS-India SRG. Through dialogue agreement was reached on the points / sections to be amended in the localisation process in each state. A draft localisation handbook was prepared by the core TESS-India academic team drawing on experience in adapting OER in other teacher education projects (Wolfenden et al, 2012) and in the second stage core groups of experts in each SRG adapted the handbook. In each state teams of subject educators subsequently undertook localisation of the translated TESS-India OER in accordance with the agreed changes on the state localisations grid prior to review and endorsement by state nominated bodies in each project state.

Following the publishing of these ‘state authenticated’ OER any institution, group of educators or individual is able to download, further adapt, modify or translate the OER for

their own purpose and context free from any central control – we have conceptualised this as stage 3 of the localisation process. (Under the Creative Commons licence there is an expectation that TESS-India will be acknowledged as the source of these amended OER and that these derivatives will also be freely available to other users.)

The development of meaningful and sustained mutual engagement between teachers and learners, essential for full participation of all learners, requires dynamic interaction between culture of the home and community and the formal culture of the school. OER localisation allows connections of different cultural discourses within formal learning, enabling different values and social practices – the ‘funds of knowledge’ (Gonzalez, 2005) to become part of cultural space of the classroom. The TESS-India localisation process paid attention to current issues in the Indian education system such as the vibrant discourse around the use of local languages and the knowledge and social practices their use conveys. Through localisation values of different groups of learners become part of the practices valued by formal education and the enacted curriculum is opened up, improving equality of access to learning for all learners.

The advent of new technologies and their rapid expansion across India offers a potential mechanism for supporting teachers’ professional learning with OER even in remote rural areas (Power, 2014). Although relatively few elementary schools yet possess computers or internet access, access to the web in teacher training colleges and secondary schools is growing alongside wide availability of sophisticated mobile phones and networks (Statista, 2015). Thus teacher and teacher educator access to high quality materials is increasingly less dependent on surmounting financial and other access barriers and increasingly dependent on their ability to take advantage to shape the tools for their own contexts and learning needs. Recognising this diversity TESS-India OER are freely available in multiple formats; online, offline access at DIETS, Colleges and BRCs and on micro SD cards for a range of mobile phones and low cost handheld computers. Tools such as ‘WhatsApp’ are already enabling practitioners to share ideas and work collaboratively to share experiences of use and adaptations of the OER appropriate for their own context.

Embedding the TESS-India OER in teacher education

The OER are addressed to the teacher, written in an informal conversational style and designed to be able to be accessed directly by teachers for independent study however we envisage that in the majority of cases use of the TESS-India OER will be mediated by teachers educators, integrating the OER within pre-service or in-service programmes or

school based teacher learning episodes in support of locally identified teacher development needs. The OER thus act to strengthen existing systems of teacher education; they not an intervention or new programme and it is not necessary to involve additional educators to support their use.

The key actors in enacting this distributed model of change are the SRGs in each state. They have worked in partnership with their respective state apex education body to develop plans for use of the TESS-India OER and articulated this activity in the relevant 2015/16 AWPB. The plans detail incorporation of the OER in many different programmes and teacher learning episodes with varied forms of mediation appropriate to the contexts to create the conditions which enable this situated approach to teacher learning and to support teachers with the dialogue and negotiation needed to move towards more participatory classroom practices. Trying out activities from the OER and discussing cases studies in existing programmes and meetings such as monthly cluster meetings, attempts to strengthen the academic practices of teacher educators working throughout the system and in particularly those working directly with in-service teachers at cluster and block level.

Examples of the ways in which mediated access to the OER will be made available to teachers are shown below.

Pre-service teacher education	In-service teacher education
Incorporation in the revised DEiEd papers in several states	Training for teachers and CRCs based on the 10 themes of the TESS-India Key Resources
State Open University using the OER in its distance learning programmes	Integration into SSA and RMSA programmes
Network of 11 universities,5 Colleges of Teacher Education and 2 constituent colleges collaborating to include the OER in their B Ed programmes	Incorporation in local academic mentoring programmes
	CPD module on CCE based on examples from the TESS-India OER
	Inclusion in programmes of NGOs

Figure 5: TESS-India OER embedding

Moving forward

The OER in themselves are not an alternative construct for teacher professional learning but they provide the tools to enable such an approach to be enacted at scale and in a sustainable fashion contributing to transformation of classroom teaching and learning congruent with the vision of policy. Their starting point is teachers' everyday professional practice making them both relevant to needs of school education and in line with pedagogic shift argued for in policy (NCF, 2005). The openness of the OER allows a broadening of the idea of what counts as valued knowledge working to close the theory / practice divide, and openness in the project model enables a way through the dialectical relationship between national policies and state structures, priorities and practices to combine large scale working across contexts with personalised teacher learning at a local level to meet identified needs (GoI, 2013 Box 21.1). The SRGs broker boundary crossing through the complex landscape of teacher education practice in each state helping to achieve 'buy-in' to the resources, distributed ownership and stimulating innovation (Wenger – Trayner & Wenger - Trayner, 2015).

Over the next few years we look forward to observing, investigating and reporting on the different forms of use of the TESS-India OER, the derivatives which arise from the original OER and the related forms of interaction which occur within classrooms, schools and colleges across the seven project states.

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