Open Research Online

Using a Structured Approach to Authoring OER Content: An Evaluation of Two Cases.

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Abstract

The Teacher Education in Sub Saharan Africa (TESSA) OER materials are a response to the teacher crisis in many developing countries, with millions of unqualified teachers entering the classroom (See www.tessafrica.net). The TESSA teacher professional development materials were developed by a collaboration of eighteen institutions and are currently being used by about 300 000 teachers across nine African countries. To ensure that the resources were appropriate and relevant, these OERs followed an agreed common template for construction with the intention to facilitate versioning for the different school contexts, in four languages.

OpenLearn (See www.open.ac.uk/openlearn) is an OER site containing over 10 000 hours of learning materials from the UK Open University. With well over five million unique visitors, its purpose was to showcase the Universities materials, to attract new students and to investigate new possibilities in the creation of new course content. It too was created around a template as shown by the OpenLearn module 'Creating Open Educational Resources' (http://openlearn.open.ac.uk/course/view.php?id=3636 .
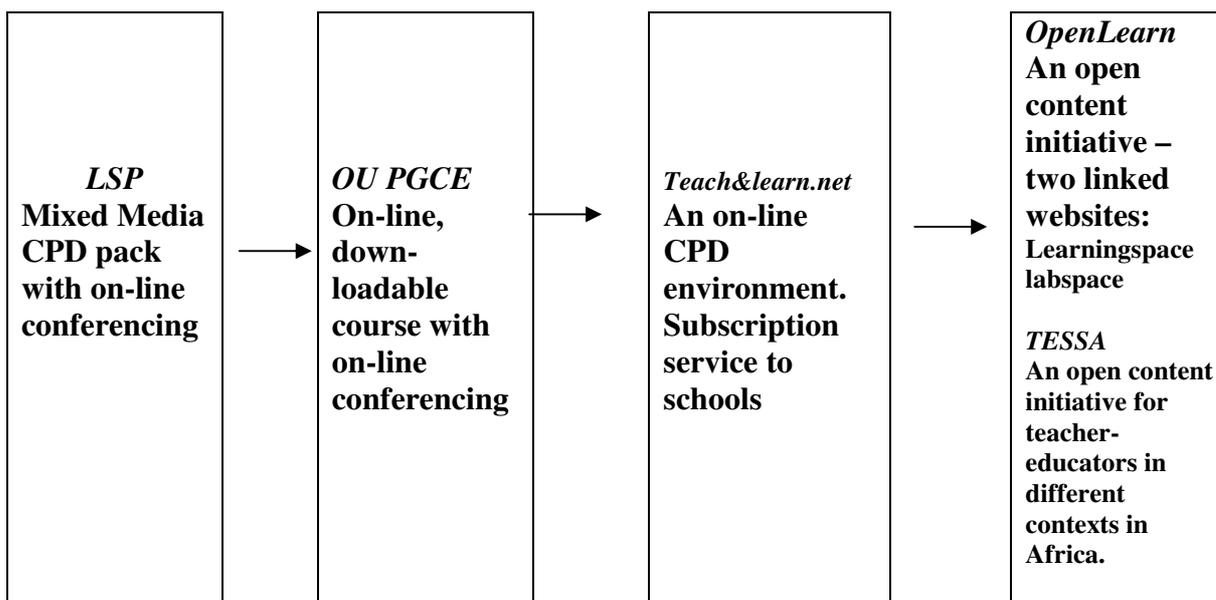
The Open University took a leading role in the development of both TESSA and OpenLearn. Using these as case studies, this paper analyses the systemic organisational benefits and constraints of a structured template approach to OER content production. It seems that such an approach is successful – both the TESSA and OpenLearn OER sites have won prestigious awards. However, this structured methodology for OER content production is considered particularly in relation to:

- The level of support needed by authors new to creating OERs
- The cost-benefits of production;
- The speed of creation and re-creation;
- The way cultural norms impact on notions of 'ownership', 'sharing' and 'adapting' the work of others;

It is suggested that making the construction template more explicit would encourage greater contribution to Open Educational Resources (OERs).

Introduction

When faced with the organisational challenge of producing a large quantity of educational material quickly and to a high quality standard, the Open University has tended to approach the task in a structured way, creating a template for authors to follow. There have been a number of initiatives, particularly focused on teachers, which has developed the approach. Figure 1 shows a chronological and organisational development from a programme called LSP in 1999 through to OpenLearn and TESSA which were originally constructed in 2007/8 and are still being developed.

LSP **Mixed Media CPD pack with on-line conferencing**	*OU PGCE* **On-line, down-loadable course with on-line conferencing**	*Teach&learn.net* **An on-line CPD environment. Subscription service to schools**	*OpenLearn* **An open content initiative – two linked websites: Learningspace labspace** *TESSA* **An open content initiative for teacher-educators in different contexts in Africa.**

The Learning Schools Programme

In 1999, The Open University's Learning Schools Programme (LSP) provided teachers with a broad range of professional tasks, supported by a mixture of print, online and face-to-face support, including:

- a printed 'teachers guide'
- a multimedia 'CD-ROM'
- a printed 'Teaching your subject' booklet.
- National and local on-line, asynchronous 'Conferences'
- Face-to-face and online support from specialist 'Teacher Advisers'.
- a subject web site

Over the life of the project, well over 160 000 teachers engaged with LSP; significant numbers (approximately 40 000 across all subjects) shared on-line ideas, resources and collaborative planning.

The OU PGCE

The initial teacher preparation course from the Open University launched in 2002, the OU PGCE, is almost entirely taught on-line. Using a combination of e-conferencing, down-loadable text modules (in pdf) and web-links, a student is able to have a course tailor-made to their personal circumstances and prior achievement. The text modules are all about 20 pages in length and written around an agreed set of key issues whatever the subject focus of the modules

TeachandLearn.net

TeachandLearn.net launched in 2006 combined a range of features used in both LSP and the OU flexible PGCE. All subjects follow the same template of twelve so-called 'web-units' which were developed out of the web environment designed for LSP. The authoring brief for the web units also reflects lessons learned from LSP and the OU

PGCE – that the unit should be relatively short and the writing tight: erring on the side of journalistic clarity rather than academic circumspection. Similarly, the design of the web units sought to clearly present on each screen *the activity* (what to do), *the narrative* (why it matters) and *the resources* (things to help you do it).

The web-unit template, a corner stone of the former Learning Schools Programme, (and similarly the OU PGCE modules) was used for authoring. Such an approach gives a degree of uniformity to what is the formidable logistical challenge of developing so many web pages with exciting and relevant 'assets' such as images, articles, audio-visual resources and appropriate supporting web-links, with copyright all cleared for use. The template also provides a common structure, so that when teachers have become familiar with one 'web unit', they can quickly 'read' the structure of other units – in a similar way to which we 'read' the structure of a newspaper, quickly skimming and locating the information that is relevant to us each day, because although the news changes, the format remains broadly the same. Each web unit comprised a maximum of 1250 words and 25 pictures, diagrams or other 'learning objects' (See Appendix 1).

Creating TESSA materials

The Teacher Education in Sub-Saharan Africa (TESSA) programme is directly addressing the challenge of providing high quality teachers to meet Millennium Development Goal 2: to achieve Universal Primary Education by 2015. The intended audience is Teacher Educators and the educators themselves worked within a tight framework, similar to that used for TeachandLearn, to create items that addressed Subject knowledge, Pedagogical Knowledge, and the needs for a particular school-system context – 'School Knowledge'.

For over fifteen years the Open University have been developing a pictorial model of teacher professional knowledge (see Leach and Banks, 1996; Moon and Banks, 1996; Banks, 1997; Banks, Leach and Moon, 1999, Banks *et al*, 2004). To do this, they observed student teachers of both English (Mother Tongue) and Design & Technology, interviewed them, and discussed their understandings and how that related to their perceptions of colleagues in school.

The model also built upon the work of others. Since the mid-1980s there has been considerable discussion and a growing body of research on the forms of knowledge required by teachers in performing their role (Shulman and Sykes 1986; Shulman 1986; Grossman Wilson & Shulman 1989; McNamara 1991). These different forms of teacher knowledge have been usefully summarised by McNamara (1991, p.115), and we present them in an adapted form here:

Subject Content Knowledge

Teachers need to have a good understanding of a substantive part of their subject to serve their pupils properly

- If the aim of teaching is to enhance children's understanding then teachers themselves must have a flexible and sophisticated understanding of subject matter knowledge in order to achieve this purpose in the classroom.

The understanding of subject must be 'flexible and sophisticated' to include the ways in which the subject is conducted by academics within the field, 'to draw relationships within the subject as well as across disciplinary fields and to make connections to the world outside school' (McDiarmid et al 1989, p.193)

- Teachers' subject matter knowledge influences the way in which they teach, and teachers who know more about a subject will be more interesting and adventurous in their methods and, consequently, more effective. Teachers with only a limited knowledge of a subject may avoid teaching difficult or complex aspects of it and teach in a manner which avoids pupil participation and questioning and which fails to draw upon children's experience.

Pedagogical Knowledge

This knowledge is labeled 'pedagogical knowledge' after Lee Shulman (1986)

- At the heart of teaching is the notion of forms of representation and to a significant degree teaching entails knowing about and understanding ways of representing and formulating subject matter so that it can be understood by children. This in turn requires teachers to have a sophisticated understanding of a subject and its interaction with other subjects.

School Knowledge

To these types of teacher knowledge we would wish to add 'school knowledge' (see Banks et al 1999, Banks and Barlex 1999, Banks, 2008a)

- By altering a subject to make it accessible to learners, a distinctive type of knowledge is formulated in its own right - 'school knowledge. In the same way that school science has differences from science conducted outside the school laboratory, so for any subject school knowledge is different from technology as practised in the world outside the school.

One might initially see 'school knowledge' as being intermediary between subject knowledge (knowledge of science as practised by different types of scientists for example) and pedagogical knowledge as used by teachers ('the most powerful analogies, illustrations, examples, explanations and demonstrations '). This would be to underplay the dynamic relationship between the categories of knowledge implied. For example, a teacher's subject knowledge is enhanced by his or her own pedagogy in practice and by the resources which form part of their school knowledge. Which teacher has not confessed to only really understanding a topic when they were required to teach it to others! It is the active intersection of subject knowledge, school knowledge and pedagogical knowledge that brings teacher professional knowledge into being.
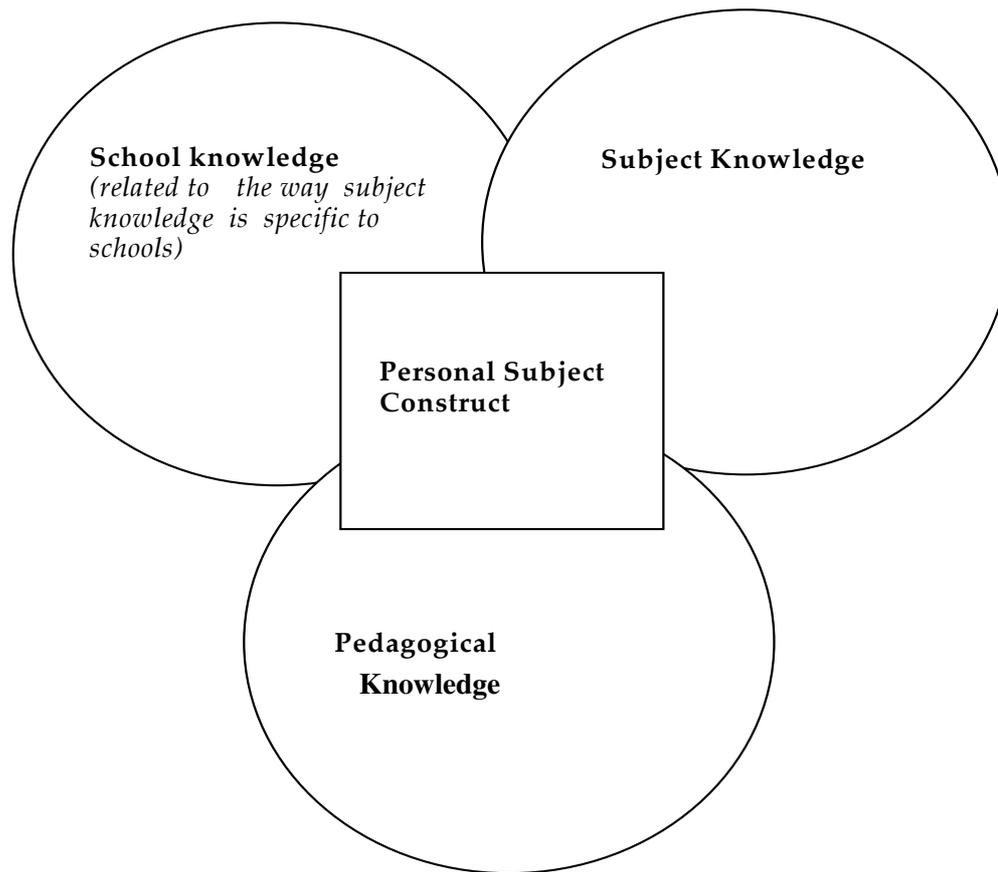
School knowledge
(related to the way subject knowledge is specific to schools)

Subject Knowledge

Personal Subject Construct

Pedagogical Knowledge

Figure 2 Framework of Teacher Professional Knowledge

Lying at the heart of this dynamic process are the 'personal constructs' of teacher and pupils, a complex amalgam of past knowledge, experiences of learning, a personal view of what constitutes 'good' teaching and belief in the purposes of the subject. This all underpins a teacher's professional knowledge. This is as true for any teacher. A student teacher has to question his or her personal beliefs about their subject as they work out a rationale for their classroom behaviours.

The diagram has some similarities with the developmental model of 'pedagogical content knowing' proposed by Cochran, DeRutter and King (1993), but is simpler in form.

This view of professional knowledge was used to set up work with over 100 teacher educators across nine countries in Sub-Saharan Africa (Ghana, Kenya, Nigeria, Rwanda, South Africa, Sudan, Tanzania, Uganda and Zambia) who produced material in a highly structured template framework (See table 1). So that the materials could be used in a great range of different contexts, the TESSA materials were built in autonomous 'sections'. The notion was that each section can be reused, removed or altered with relatively little consequence on the material surrounding it.

Table 1 The TESSA template.

Section component	Generic or versioned
Learning outcomes	Generic
Narrative (*frames the problem, links the activities*)	Generic
3 activities	One generic, two with some contextual references .
3 case studies	One generic, two some contextual references or highly contextualised.
Up to 6 supporting resources	Highly contextualised - Up to two versioned

Connolly, Wilson & Wolfenden, 2007 p6

The materials once authored are localized in a number of ways and levels. First, the materials are translated from the agrees 'Pan-African' version into different local languages of instruction (to date : Arabic, English, French and Kiswahili). To make the materials appropriate to so many countries other techniques of localization were used. Names of people and places were changed as were the plants, wildlife and local artifacts that were referred to in the sections. In use, greater variation was necessary. For example, in Sudan the TESSA materials had to be carefully extracted and matched to the needs of the National Curriculum. In using the template approach to versioning, Wolfenden has summarized the challenges as follows:

- Ensuring integrity of learning outcomes are maintained
- Preserving emphasis on activity based learning
- Encouraging adaptation of other's material
- Balancing social and economic realities and aspirations
- Balancing 'localness' with an African and global dimension across the modules

(Connolly, Wilson & Wolfenden, 2007 p10)

In 2009 TESSA won the Queen's Anniversary Prize for Higher and Further Education.

Creating OpenLearn Materials

OpenLearn was designed to offer free resources by taking examples from the existing hard-copy courses of the Open University and choosing a 'stand alone' section that could be presented in web form.
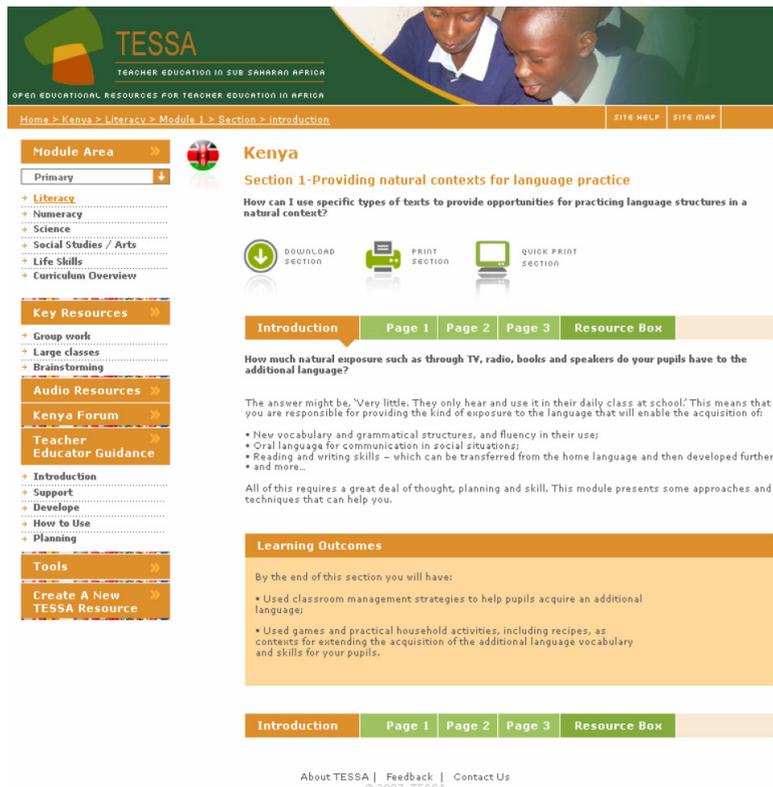
Figure 3: A TESSA Literacy Section on the Kenyan homepage

The criteria for what would be an appropriate OpenLearn unit was quite broad. It was decided that Units:

- Are 3-15 hours of study time in size, ranging from roughly an evenings worth of study to a weeks worth of study part time;
- Will be labelled as being at a particular HE level (1,2,3 or M) as known within the QAA's Framework for Higher Education Qualifications and articulated in the OU levels framework document;
- Are self contained with no references within them to other Units and limited references to external URLs;
- May be subdivided into smaller sections or bits of 3 hours length;
- Will normally have no more than one learning outcome or competency per 3 hour bit;
- Can involve a mix of media but will use more activities than is traditional in a pedagogic text;
- Will comprise both material study time and learner thinking time.
(Lane, 2006 p7)

As time was pressing to satisfy funding milestones, the material on OpenLearn generally went on to the site as a straight 'lift' from the existing Open University course (be it text or web based in the original) with little additional work – but video and sometimes flash animations were added to better integrate the text-based original course materials and to enhance certain explanations. The Rules or 'Template' for those preparing the web material was as follows:

- On screen text and static graphics (pictures, diagrams) representing a web page, with normally no more than two screens to read at any one time to stop excessive scrolling;
- Web pages should be joined by hot links in the simplest manner possible with no more than two levels of hierarchy;
- Text as pdfs for reading on screen or printing off with each document usually no more than 5 sides of A4 for each;
- Total text components, whether web pages or as pdfs not to exceed 1000 words per study hour
- Animations, audio clips and video clips can be used but kept to a minimum unless already available. They must also be pertinent to the topic and not seen as infill;
- Similarly, software applications can be included if already available and suitable for open content use on the web.

In a few cases it should be possible to base a Unit around a readily available printed document or book(let) which users can get for free or at very low cost
(Lane, 2007, p 8)

Lessons Drawn from TESSA and Open Learn

The level of support needed by authors new to creating OERs

One of the rationales for the Open University investing its own money in OpenLearn was that it would be a source of new curriculum. While it is true that existing curriculum has been corrected by making it more widely visible, the level of contribution of new course material has been very modest. A clue to this is seen in the workshops for material production set up for TESSA. The idea of active learning is in itself difficult and to write in a way that encourages others is difficult. Open University materials have been drafted over many months and critiqued by a course team. The level of work need and fear of 'exposure' of one's work to the outside world should not be underestimated.

The cost-benefits of production

OpenLearn materials were relatively cheap to produce as they were largely in existence from current courses. However, each module cost about £3000 of production time – editors, video and flash specialists and academic vetting - to produce. The TESSA workshops were more 'creative' in producing original and then versioned (localised) material but these too required the covering of travel and *per-diem* costs for participants, and the 'opportunity costs' of those working away from home were not included.

The speed of creation and re-creation

As might be imagined, the template method and familiarity with use enabled the speed of production to pick up during the time of use. The full-time staff working on OpenLearn could turn around a 'straightforward' unit in about 10 days. TESSA materials were developed in earnest during workshops, but the progress of work between workshops was rather slow due to most participants working on TESSA as a

part-time occupation in addition to a heavy workload at their institution. It took three years for all the TESSA materials in the different languages to be in place.

The way cultural norms impact on notions of 'ownership', 'sharing' and 'adapting' the work of others

The TESSA approach to the development of materials was to go to the institutions involved directly, rather than approach them via the government Ministry of Education and other 'official' channels. The institutions were in Anglophone countries and generally were created in the Anglos-Saxon tradition of use and re-use of worksheets and materials. In schools in the UK, for example, great care has to be taken to ensure that teachers (and others) do not infringe copyright law as they photocopy sections of books and use the work of others for use with their pupils. To realize that materials are available for use under Creative Commons rules is a boon to them. It was interesting, however, that in Francophone countries, the was a greater 'top-down' approach to gaining permission to engage in TESSA and also a greater concern about using the work of others.   It seemed a curious antipathy towards possible 'plagiarism' combined with a feeling of 'ownership' of one's intellectual property.

It may be this view of being cautious of taking the work of others, feeling that one's own work and contribution to OERs should be acknowledged and a concern that one's contribution may not be 'good enough' that discourages people from contributing their own work to share with others in both TESSA and OpenLearn.

It may be that an explicit statement of the writing frames used for these two cases would the key to unlock the wider contribution to submit new work from the current millions of consumers of both TESSA and OpenLearn.

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Appendix 1

STRUCTURE BRIEF FOR TeachandLearn UNIT AUTHORS

STUDY TIME		WORD USE
	A Intended outcome(s) of the unit – relates to overall purpose of the course/resource	50 words
	B Unit diagram/site map	one screen
½ hour	**C** Sequence to arouse strong motivational interest	
	D Mediation of opening sequence – including direct link to classroom – comment/discussion	200/250 words
7 hours	**E** The central section of the unit should have a narrative thread. Dense text should be avoided. There should be: (a) the use of at least 2 or more pedagogic strategies (see list) (b) the use of at least 4 different types of resources (see list) (c) development of a range of activities (4 at least) which cover individual, classroom and colleague dimensions (some activities may combine two or more of these). Every unit should have 2 activities that involve trying things out in the classroom. (d) references out to at least 2, and not more than 5, websites	800 words
2½ hours	**F** Unit closure allowing active, summative and evaluative process	200 words

positioning to be decided