

Building an effective 'Open Education Resource' (OER) Environment for Teacher Education in Sub-Saharan Africa: The TESSA Experience

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INTRODUCTION

The provision of basic education for all children by 2015 is one of the world's major educational objectives. Through UNESCO's Education for All (EFA) commitments and the UN's Millennium Development Goals (MDGs) national and international attention is focused on measures to achieve this end; the number of out of school children dropped from 96 million in 1999 to 72 million in 2005. But increase in pupil enrolment has increased pupil-teacher ratios; across Sub-Saharan Africa the figure has risen from 41:1 to 45:1 since 1999. In Congo it is 83:1 (UNESCO, 2008). And there are still over 40 million primary-age children not in school (UNESCO, 2007a).

Teachers are crucial to achieving EFA. Data is difficult to substantiate, but it is estimated that over half of existing teachers are unqualified, and over four million extra teachers are needed (Global Campaign for Education, 2005; UNESCO, 2008). In addition there are issues around teacher professionalism and status and the impacts of teacher migration and HIV/AIDS.

The Teacher Education in Sub-Saharan Africa (TESSA) research and development programme is concerned with the huge challenges of supplying, training and retaining effective teachers to meet the needs of expanding primary education sectors across the region. Combining innovative education models and technological tools, TESSA is creating an extensive range of web-based open education resources (OERs) and advisory support systems to extend access to new modes of school-based teacher training (Moon and Wolfenden, 2007). TESSA represents Africa's largest teacher education research community, extending across institutions in Ghana, Kenya, Nigeria, Rwanda, South Africa, Sudan, Tanzania, Uganda and Zambia together with international organisations. The consortium has grown from long-standing academic relationships, and friendships. TESSA's strengths are grounded in these relationships, drawing from both the breadth and diversity of experience, and shared values and commitment to education.

The TESSA website, launched in 2008 following a two-year development period, supports the development of new teacher training course provision and enhancement of existing provision. A wealth of OER materials and guidance are freely available to use, download, distribute, adapt and re-upload to the TESSA website. Users can share opinions and seek advice through the TESSA Forum. Over 100 African academics participated in the creation of www.tessafrica.net and over 1,000 teachers were involved in the developmental testing of the site and its content. From 2008-9 it is estimated that half a million teachers will be using the TESSA materials through a wide variety of modes.

Drawing on a range of data generated in TESSA's development this paper explores the contexts, challenges and choices that have contributed to the build of this OER environment. Through frameworks of pedagogy, technology and research, it discusses TESSA materials creation (including audio), web-design, and use of the materials, within courses.

THE TESSA STRATEGY

A number of studies have pointed to the instability of policy structures to support the extension and improvement of teacher education in Africa. Most notably a series of research studies

initiated through the 'MUSTER' programme highlighted the inadequate, often incoherent, strategies addressing this enormous challenge (Lewin, 2002; Lewin and Stewart, 2003). Successive UNESCO monitoring reports have articulated the pressing need for strategies to improve the provision and quality of teacher education and training (UNESCO, 2005; UNESCO, 2008).

In response, initiatives such as TTISSA (Teacher Training Initiative for Sub-Saharan Africa) have emerged. TTISSA is a ten-year, UNESCO-led programme working with global, regional and national stakeholders to facilitate advocacy, capacity building and policy development around teacher education (UNESCO, 2007b). Working in collaboration with TTISSA, and other initiatives, TESSA is providing tools to enable practical implementation of these objectives.

Teachers and teacher education in context

Consideration of the practical realities facing teachers and teacher training systems in Sub-Saharan Africa reveals a wide range of issues and challenges.

Firstly, a severe shortage of qualified teachers: over half of existing teachers are untrained. Nationally Ghana has a quarter of the teachers it needs, Lesotho a fifth (UNESCO, 2005). And in-country teacher distribution is frequently uneven due to decentralised education planning systems (Moon, 2008). Teacher migration and HIV/AIDS contribute to these shortages (Lewin and Stewart, 2003; McGreal, 2005; UNESCO, 2005).

Secondly, there is a reliance on traditional campus-based training characterised by relatively low student-capacity and removal of teachers from their classrooms. These courses are often predominantly theory-based with consequent influences on trainees' teaching styles; teachers teach the way they were taught and need intense and supported learning experiences to change. Reports show that even where Sub-Saharan African school curricula encourages investigational or activity methods, the majority of lessons rely on traditional rote-learning (Mereku, 2003; Mirembe, 2002).

Thirdly, teachers' views and experiences are not taken fully into account by policy makers or unions. Teacher housing is often insufficient and salaries and morale are low (or non-existent). There are also reports of corruption in education systems. Teaching has low status, on local and national levels (Transparency International, 2006; VSO, 2002).

Fourthly, teachers in Sub-Saharan Africa frequently work in two or more languages, where the official language is often not their first language or that of their pupils. The low literacy levels of some teachers, and an inability to comprehend academic texts has been reported (see for example Bertram, 2006).

Fifthly, working conditions for many teachers are not conducive to teaching and learning; there are numerous accounts of teachers working in large and over-crowded classrooms, sometimes dilapidated, often multi-grade and frequently lacking in furniture, teaching aids and resources (see UNESCO, 2002; Lewin, 2002; Colclough et al, 2003, Remy, 2002;).

TESSA's understanding of these conditions was crystallised through the "Teachers' Lives" research project; an in-depth, ethnographic study of five teachers from Ghana, Nigeria, South Africa, Kenya and Sudan. The research revealed that these five teachers are no strangers to the challenges outlined above. They are aware of the low status teachers have in their wider societies and are truly concerned about their salaries. But, on a variety of levels, they also feel proud to be a teacher, have high self esteem, draw satisfaction and motivation from daily challenges and achievements, and have a strong inner-belief that teaching is a good, moral and respectable profession.

The Teachers' Lives research highlighted teachers as positive agents of change, both with regards to their communities, and their own professional development. Theresa Acquah, for example, is a twenty-five year old teacher at Bronyibima Primary school in Ghana's Central Region. Theresa is currently upgrading her teaching certificate to a diploma through a three-year distance programme with the University of Cape Coast. To cope with the remoteness and solitude of the study environment, Theresa and three other students from nearby villages have formed an informal study group to share ideas about their teaching practice.

The TESSA Response

The TESSA Consortium, made up of eighteen African and international institutions, is developing a highly creative response to these challenges in teacher education. Working through closely knitted and complementary strands of research and development activity, the TESSA initiative is exploiting the potential of new technological and communication tools to develop materials and tools. A number of studies have analysed the experience of new forms of information and communication technologies (ICTs) and their use in education initiatives (see Farrell and Isaacs, 2007; Leach, 2004). TESSA has focussed on bringing together the affordances of increasingly available connectivity in the region, the advent of Open Educational Resources (with their associated philosophy of adapt and share) and aspects of the social web. This unique mix has led to the creation and production of original audience –specific Open Educational Resources (OERs) in different forms to support teacher education. User engagement and interaction is through the TESSA website. TESSA can be described by the following characteristics:

- teacher educators constructing and enhancing courses by building learning pathways through a series of locally relevant study units that are freely available and easily accessible (OERs);
- location of teachers' learning in their own classrooms, grounded in their own experiences, linking theory and practice through classroom activities (Moon and O'Malley, 2007)
- course or programme delivery is to scale, but locally appropriate;
- a supportive on-line environment for communities of TESSA users.

The following sections show how this model has been developed.

THE TESSA MATERIALS

Core TESSA content consists of on-line, text based study units developing key teacher practices, competencies and skills delivered through the context of pupil school curricula. These TESSA materials are designed to be a pedagogic "toolkit" of skills, knowledge and artefacts to enhance the professional knowledge (both subject and pedagogic) of teachers. The school-integrated activities, at the heart of the study units, combine theory and practice, and encourage teachers to learn about teaching through classroom experiences while stimulating experimentation and critical debate (Connolly et al, 2007). The materials were refined through workshops and developmental testing and subject to rigorous quality assurance procedures.

The text materials are complemented by a series of audio materials. The efficacy of audio to support teacher development is well documented but currently little deployed in the region. TESSA audio materials include thirty short dramas, using characters from a radio drama series together with teachers' audio diaries. Centered on key classroom incidents, the audio clips illuminate issues and model good practice to inform and stimulate discussion and reflection.

Study units focus on core curriculum areas; Literacy, Numeracy, Science, Social Sciences and the Arts and Life Skills. The original materials, written by educators from across the region, have

been contextualised into nine country-formats including versions in French, Arabic and Kiswahilli. In total TESSA has created seven hundred and fifty sections.

TESSA sections (study units) are the smallest level of granularity available on the website and written in a highly structured template. Sections are designed to possess integrity and autonomy with a high degree of internal context. Each section begins with learning outcomes and teacher learning is scaffolded through the activities and case-studies to the final, key activity (Connolly et al, 2007). This scaffolding also supports language comprehension. The template structure facilitates easy localisation for different environments; component parts of each section are designed to be generic or with contextual references. Localisation focuses on the latter components - case studies and supporting resources.

'Key Resources' offer practical advice on a wide range of topics such as "working with large or multi-grade classes" and "using the community and the local environment as a resource". Users can develop these materials further through the OER 'adapt and share' philosophy and extend sections by incorporating other OERs.

THE TESSA WEBSITE

The TESSA materials are located on the TESSA website (www.tessafrica.net). Built on open source technology, the website is at the heart of the TESSA initiative (see fig.1 below).



Fig.1 TESSA website Welcome page

From its conception the TESSA website aimed for international credibility, yet to be locally appropriate. The underpinning organisational principle of the TESSA website is country identity. Users select their country to locate materials appropriately contextualised and to participate in online discussions with professionals in their locality and in the language of their choice.

In 2005, TESSA commissioned a study of connectivity in Africa. It found Africa to be the “least connected continent” in terms of both total bandwidth and internet penetration. However, it noted a growing number of internet access points and reported that higher education institutions are increasing their budgets for ICT infrastructure (SAIDE, 2005:11). Similar findings are reported elsewhere. More recently a Commonwealth of Learning and infoDev report noted that Sub-Saharan African Universities and schools are developing internal ICT policies (Farrell and Isaacs, 2007) and the OLCOS Roadmap:2012 highlights the growing numbers of educators and students using the internet for personal and professional use (OLCOS, 2007).

While such findings support the development of the TESSA website, for many in Sub-Saharan Africa, especially those in rural areas, internet access is expensive, limited, and hindered by unreliable electricity and fragile ICT infrastructures. Indeed these factors have challenged communication and hampered schedules throughout TESSA’s development. It was imperative that the website was designed to take these conditions into account.

TESSA’s response was to develop the OERs in a variety of formats; html, ‘Word’ and PDF, for use both on-screen and in print (see fig.2). A document transformation ‘engine’ was designed into the site specifically for this process.

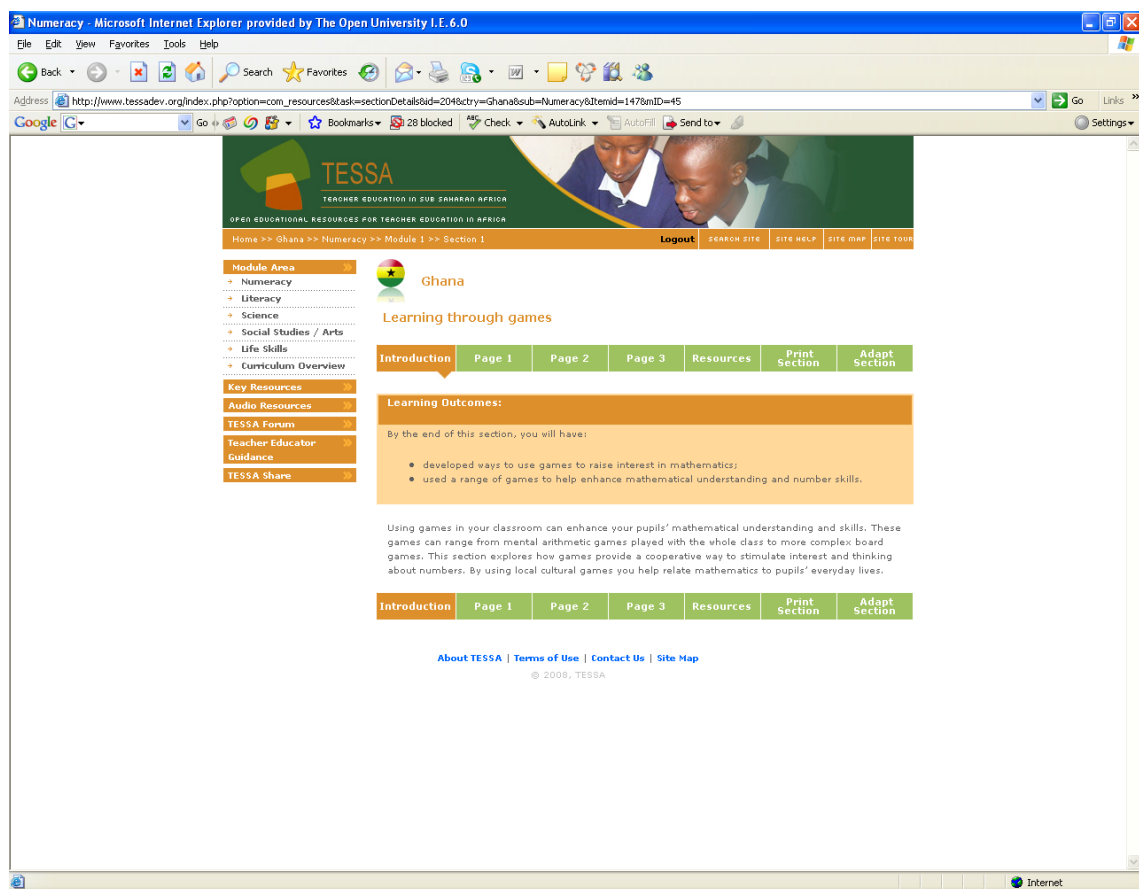


Fig.2 TESSA Section (Ghana, Numeracy, Module 1, Section 1)

Short download times are essential for users with limited bandwidth so files were designed in simple templates with compressed images. An awareness of the scarcity of printing materials also influenced design, minimising the use of paper and ink. Institutional course developers are thus able to print materials in an attractively designed format; these can be easily integrated with existing materials for use with students.

The audio materials can also be distributed in a variety of modes; their delivery through an institutional radio station in Nigeria is currently being explored (Connolly et al, 2007). As with the materials development, feedback from regular user-testing of the website by teachers and teacher educators across the region guided development. For example, following early feedback, changes to the navigation and language used for 'sign posting' across the site were implemented.

INSTITUTIONAL IMPLEMENTATION OF TESSA

The TESSA consortium has been critically aware of the need to consider the "legacy of traditional institutional frameworks" and existing course models to ensure the TESSA OERs are accessible, useable, adaptable and durable (OLCOS, 2007 p.41). The capacity and flexibility of TESSA OERs allows for a wide variety of implementation models, for both pre- and in-service courses and at informal, institutional and national levels.

The implementation of TESSA in teacher education programmes to date reflects national and institutional priorities. Themes, however, are beginning to emerge. The case studies below highlight some of these themes and the factors driving their development.

Integrating TESSA into existing curricula

The granular form of TESSA enables integration of the TESSA materials and approaches without major revisions to existing course materials. The National Teachers' Institute (NTI) of Nigeria is incorporating TESSA activities and case studies within the general and subject methodology course materials of the Nigerian Certificate of Education; a distance learning programme for in-service teachers. Student teachers carry out the activities during teaching practice periods, supported by tutors and teaching practice supervisors.

The Open University of Sudan is restructuring the teaching practice components of their Bachelor of Education programme with TESSA. Relevant TESSA sections are distributed to student teachers at teaching practice orientation sessions and their use is supported throughout the teaching practice periods. The diversity of sections encourages students to engage in exploration of a range of teaching strategies.

Creating new curricula using TESSA

A national review of the Nigerian Certificate in Education, the predominant pre-service teaching qualification, identified the need for the new curriculum to focus on active teaching skills and their development in the classroom. The National Commission for Colleges of Education, in collaboration with TESSA, is incorporating TESSA activities and case studies into the new curriculum to respond to these needs. Individual Colleges of Education, delivering this programme on-campus, will have access to the full set of TESSA materials in addition to TESSA activities and case studies set out in the national curriculum.

Implementing TESSA through ICT initiatives

At the University of Education, Winneba, a new Post Graduate Diploma in Mentorship is being developed to address an acute national shortage of support for newly qualified teachers. A major thrust of the pedagogic approach is the creation of specially created videos of TESSA activities and the use of TESSA audio dramas distributed on CDs to enhance student learning.

This model brings a new perspective on how active teaching strategies can be introduced to student learners

Students on the Bachelor of Education programme at the University of Fort Hare in South Africa are creating their own learning pathways linking TESSA activities to their individual needs and areas for development. This model utilises the granularity of the TESSA resources to empower the students to develop their own learning.

Informal implementation of TESSA through student support groups

At Kyambogo University, Uganda, TESSA resources are being used by students on the Diploma in Education Primary External. Informal student self support groups have grown up and are developing a focus on supporting the use of TESSA activities during semesters, with the facilitators able to access TESSA resources.

NEXT STEPS

TESSA has achieved a great deal over the last two years. It has developed into the largest teacher education research initiative in Sub-Saharan Africa. It has created a website with seven hundred and fifty study-units that are being incorporated into teacher education programmes in thirteen higher education institutions across Sub-Saharan Africa. Nearly half a million teachers will be trained on these programmes in the coming year.

TESSA is an example of a new generation of audience-specific OERs (Moon and Wolfenden, 2007). While continuing to support implementation in existing programmes and courses, TESSA is also looking forward. It is interested in the emergence of new models of use, especially those designed to reach teachers in remote areas. It intends to sustain the current research agenda around communications technologies across Sub Saharan Africa and develop new agendas around the support of TESSA communities, integration with other OERs and assessment accreditation of OER use for different environments and educational systems. It is supporting regional collaborations between TESSA partners.

Teachers are crucial to achieving international education goals. TESSA is committed to these targets, but is also looking beyond them. The TESSA website has the potential to become a significant forum for communication and collaboration in international teacher education - and also to impact significantly on individual teachers. As Mavis, a South African teacher participant in the developmental testing of the TESSA materials claimed: "through the TESSA materials I have learnt methods that give me the inspiration, confidence and skills to be the teacher I have always wanted to be".

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