Introducing digital Open Educational Resources into Zambian schools through school-based professional development

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Introduction: approach and aims

We report on the outcomes of a Centre for Commonwealth Education (CCE) funded pilot project executed in partnership between academics at the CCE and the Institute for Distance Education at the University of Zambia. The CCE is based at the Faculty of Education at the University of Cambridge, UK, and is funded by the Commonwealth Education Trust. The focus of the Centre is upon the advancement of primary and secondary education, pedagogy, educational leadership, and teacher education in a range of countries within the Commonwealth of Nations. Other partners in our project include Africonnect and the iSchool project, and the Zambia Ministry of Education.

The longitudinal OER4Schools project assesses the feasibility of supporting interactive forms of subject pedagogy through use of Open Educational Resources (OER) and ICT (Information and Communications Technology) in computer- and Internet-enabled primary and secondary schools in South-East Africa, initially focusing on Zambia. It also identifies the needs of school-based professional development adapted to the local context. This project seeks to bridge the North-South education divide by leveraging OER and ICT to support development of South-East African schooling and widen learner participation. Through the global OER movement, there are numerous high quality learning materials openly available that could be beneficial particularly in educational contexts where resources (e.g. teaching materials, books, libraries) are scarce. In Africa, however, there is very little awareness or exploitation of the possibilities afforded, and OERs have also proven difficult to use – for both educational and technical reasons. These include appropriate pedagogies associated with using OER, curriculum relevance, lack of appropriate technical facilities and bandwidth constraints. It thus becomes useful to consider OER, pedagogy, and ICT as axes in a three-dimensional space, and to assess whether there are areas within this OER-Pedagogy-ICT space that provide high impact, feasible solutions and new ways of building and sharing knowledge. The project pays special attention to rural connectivity, and locally sustainable models of achieving this. In summary, a unique opportunity exists to build a new OER community with a Southern focus.

Our project seeks to innovate by combining pedagogy, ICT and OER in the most optimal way, while construing ICT as a servant to pedagogy. Heavy investment in ICT will sooner or later be made by any developing country that

can afford it, but often this happens without clear understanding of the effective use of ICT in an educational context. Research shows conclusively that if ICT is simply dropped into school or even an educational system, it will be used rarely or poorly and fail to improve teaching and learning. Support for teachers is crucial to promote innovative ways of using ICTs. There need to be clear options and advice for teachers, school administrators, and education ministers on how to best support the use of ICT. Research shows that dialogue and debate between teacher and learners and between peer learners is very important. In particular, teaching needs to be adaptive to learners' needs, knowledge, and thinking if learning is ultimately to be successful.

Engagement with new technologies as tools offers a significant opportunity to update outdated didactic pedagogies, entrenched in many schools, that are a serious obstacle to successful education. Conventional 'chalk-and-talk' does not encourage learner input, critical thinking or construction of deeper forms of knowledge. There are positive examples where pedagogies can be gradually transformed through teacher-led discussion, modeling and peer observation, cascade-type continuing professional development (CPD), as opposed to one-off short-term, expert-led interventions. Overall, moving towards new pedagogies involving participatory approaches – such as dialogic teaching and enquiry-based learning – is thus possible, and digital OER can facilitate this. Of crucial importance is the integration of ICT use into subject teaching – curricula, schemes of work and lesson plans – rather than ICT teaching as a context-free set of discrete skills. To support this process we provide sample resources and ideas for incorporating ICT into existing curriculum materials, but these are stimuli rather than prescriptive models for teachers to copy.

Pilot project

We are currently working with 8 experienced teachers in 3 Zambian primary schools; two are located near to Lusaka with the third more remote, and all serve disadvantaged, rural communities. The schools all have internet connectivity and student access to a computer room, and we also provided each teacher with a portable netbook computer with basic software. One school used the facilities of the adjacent teacher training college; two college lecturers were involved in the project. The teachers had very limited prior experience of sourcing and integrating digital resources in their subject teaching. The aim of this pilot phase is to develop, support and trial uses of OERs combined with new interactive pedagogical approaches for teaching mathematics. An initial 1-week intensive workshop was held in January 2010, during which themes of interactive teaching, collaborative, enquiry-based learning, OER, and ICT use were developed participatively. The workshop itself modelled an interactive and participatory pedagogy; it emphasised teacher-teacher interaction and collaboration, and offered some opportunities for peer observation. Our Zambia-based researcher and experienced teacher educator subsequently supported teachers in lesson preparation as needed, recorded classroom practice in each classroom and assessed participants' reactions and learning, eliciting messages for embedding basic ICT and OER use in teacher education. Data collected over 4 months include digital video and audio recordings of 26 lessons with Grade 1-8 classes, observation notes and

researcher commentary, digital photographs, recorded interviews with teachers and school directors, electronic copies of lesson plans, etc. A community of practice mailing list set was also set up where participants shared their digital resources and lesson plans.

Analyses are in progress at the time of writing but preliminary findings indicate that all 8 participants developed their use of ICT and integrated it into mathematics teaching (using it for communication among themselves too and with the research team). The teachers searched for OER and shared their discoveries with the group. In addition, there was a marked increase in the use of interactive, collaborative approaches, with learners being newly able to explore, discuss and present to peers.

One of the examples of a success story in this project was that of a Grade 7 teacher at Chimwemwe Trust School, who was able to integrate digital resources into interactive teaching activities. The teacher managed to find appropriate resources, and was able to build meaningful activities around the resources. Initially the students worked in groups to undertake practical work in the classroom, including identifying tools for measuring and taking measurements of their own using rulers, before proceeding to the ICT lab to extend the exploration. The computer-based interactive activity then engaged pairs of students in estimating and measuring the lengths of objects (lines and pencils) using the on-screen ruler, to input their responses and the units of measurement and to verify these. The students' performance was excellent and they were motivated to work through the tasks of increasing difficulty, portraying higher order thinking and making new discoveries along the way, such as the use of a false zero in counting or when measuring, and conversion of units (e.g. from millimetres to centimetres).

The future

A further important aim of the pilot project is to conduct the necessary research to build a proposal for longer term external funding. We seek to collaborate with other organisations and institutions working in this space. The proposal will draw on a number of previous activites, including the iSchool project, a UNESCO OER community discussion on access to OER, the UNESCO Section for Teacher Education work on OER, the OER Africa and TESSA work, and most recently our own small-scale pilot. While the project is conducted in Zambia, it is very much situated in the South-East African context, and it is anticipated to be relevant to a wide range of countries in sub-Saharan Africa. The ultimate aims are to develop methodologies that promise lasting educational transformation, models for OER-ICT-pedagogy adoption in poorly resourced educational systems, and guidelines for implementing more effective learning environments.