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Experiences of Teaching Computer Literacy to South African Teachers Using Blended Learning and Free Open Source Software

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ABSTRACT

Information and Communication Technology (ICT) in education is essential to equip all citizens with the necessary knowledge in the information age. While most learners in the developed world have had the chance to be exposed to ICTs and learn basic computer skills through formal or informal learning, in developing countries disadvantaged learners usually do not have the same chances to acquire these skills at school or in their communities. For this reason it is crucial that educators are the first to be trained in using ICTs. This strategy would not only trigger a multiplier effect in their communities, but it is certainly the most cost-effective way to increase digital inclusiveness among the most disadvantaged members.

The South African Department of Education is willing to facilitate the introduction and spread of ICT in Education, but still has to launch a massive national campaign to train all teachers in the use of computers. Most ICT courses for teachers organised at a local level are geared mainly towards administrative purposes, and not towards integrating ICTs into their curricula.

The aim of this research was to identify and explore challenges to the training in ICT of large numbers of teachers from very disadvantaged contexts. Four main primary objectives were identified in order to reach this aim: (1) to study the issues in the disadvantaged South African schools and the ICT competencies of their teachers; (2) to analyse the challenges and limits of using blended learning and free open source software within the South African schools context; (3) to investigate the outcomes of the computer literacy programmes offered by Rhodes University to school teachers; and (4) to prove the feasibility of ICT training with large numbers of teachers from disadvantaged schools through designing, implementing and managing a computer literacy course using blended learning and free open source software, which would lead to an increase in teacher confidence in using computers and narrow the ICT skills gap.

The principal ICT issues found in the disadvantaged schools were the lack of confidence of the teachers in using computers, mainly due to the lower level of education provided to the non-white population during Apartheid, and the overestimation of the level of computer literacy of those few teachers who were already computer literate.

The lack of computers and limited access to the Internet, for the non-white South African ethnic groups, are real constraints that limit the benefits of blended learning, compared to the situation

experienced by learners who live in more developed countries. Due to these constraints, blended learning systems are forced to adapt to the local settings. However, the present constraints do not severely limit the possibility of implementing blended learning programmes, they only influence the type of blending chosen. In addition, the introduction of FOSS educational software and the use of new Linux distributions, such as Edubuntu, are invaluable tools for integrating ICTs into the curricula, although the present poor usability of free open source software is sometimes a major barrier that prevents its diffusion and adoption.

Regardless of the good quality of education received at Rhodes University by the teachers who attend the few computer literacy courses available, the findings of this research revealed that the main limitations are the teaching of ICT mainly for administrative purposes, the exclusive use of proprietary software, and the small course capacity. The computer literacy programmes available at Rhodes University make no use of free open source software and cater only for very small numbers of educators, usually 25 participants, even though this organisation has the means, knowledge and facilities to accommodate large numbers of attendees.

Finally the research has proved that it is feasible to provide computer training for more than 200 educators at a time at Rhodes University, using blended learning systems and free open source software. The final assessment on the newly acquired skills of the teachers, proved that on average, 77.50% of teachers responded correctly to questions at the end of the course. The confidence gained by the teachers to independently use a computer and the feedback received from the tutors throughout the course, showed the viability and sustainability of this kind of blended learning approaches.

The development of teacher education in all relevant fields needs to be prioritised to subsequently improve the quality of education for students in underprivileged schools in South Africa and reverse the impact of the Bantu education system. This research has determined that a major limiting factor in ICT education for teachers is the lack of large scale courses that are specifically designed for the learner level of the majority of teachers from disadvantaged backgrounds, the beginner level. It is therefore not only a matter of lack of investments that prevents the taking off of ICTs in the developing world, but mainly cultural and political decisions that have to be made in order to guide the change that would allow all citizens to have the means and the knowledge to access the information and improve their standard of living.

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ACRONYMS

ABET	Adult basic education and training
ACE	Advanced Certificate in Education
BBBEE *or* **BEE**	Broad Based Black Economic Empowerment
BL	Blended Learning
C2005	Curriculum 2005
CMS	Content Management System
DET	Former (Apartheid-era) Department of Education and Training
DoE	Department of Education (national)
ECD	Early childhood development
EFA	Education for all
GET	General education and training
FET	Further education and training
FOSS	Free Open Source Software
HE	Higher education
HEIs	Higher education institutions
KDE	Konqueror Desktop Environment
LER	Learner-to-educator ratio
LMS	Learning Management System
LO	Learning Object
LSR	Learner-to-school ratio
MLE	Managed Learning Environment
MOODLE	Modular Object-Oriented Dynamic Learning Environment
NCS	National Curriculum Statement
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
NMMU	Nelson Mandela Metropolitan University
NPDE	National Professional Diploma in Education
NQF	National Qualifications Framework
OBE	Outcome-based education
ODL	Open and Distance Learning
OLPC	One Laptop Per Child
PEDs	Provincial Education Departments
PGCE	Post Graduate Certificate in Education
PS	Primary School
RN	Republic of Namibia
RNCS	Revised National Curriculum Statement
ROI	Return on Investment
RSA	Republic of South Africa
RU	Rhodes University
RUCUS	Rhodes University Computer Users Society
RUMEP	Rhodes University Mathematics Education Programme
SACE	South African Council of Educators
SAQA	South African Qualifications Authority
SASA	South African Schools Act, 1996
SEN	Special educational needs
SETAs	Sector Education and Training Authorities

SGBs	School Governing Bodies
SNE	Special needs education
SS	Secondary School
Stats SA	Statistics South Africa
TLI	Teacher Laptop Initiative
UFH	University of Fort Hare
UNISA	University of South Africa
VLE	Virtual Learning Environment
ZAR	Rands, the currency of South Africa (Zuid Afrikaansche Republiek)

South African Provinces

EC	Eastern Cape
FS	Free State
GP	Gauteng
KZN	KwaZulu-Natal
LP	Limpopo
MP	Mpumalanga
NC	Northern Cape
NW	North-West
WC	Western Cape

"The problems that exist in the world today cannot be solved by the level of thinking that created them."

Albert Einstein