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Regional Focus Issue Editorial: A Snapshot of Distance Education in Africa

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The Millennium Development Goals (MDGs), established by the United Nations in 2000, emphasized the importance of education to the development and achievement of human rights and to social and economic development. One of the eight goals of the MDGs also made access to basic education imperative by the year 2015. Achieving the Millennium Development Goals and the ‘Education for All’ (EFA) targets, to which African Governments have committed themselves, is a daunting task that requires, among other initiatives, the use of open and distance learning (ODL).

African countries face tremendous challenges vis-à-vis other geographies and regions. Rapidly increasing demands for all levels and forms of education coupled with local and regional governments’ limited capacity to expand provision of education through traditional bricks-and-mortar institutions leave ODL as a viable option to address and match growing demand for education. It offers one way to increase the capacity of educational systems without incurring the cost of building facilities by allowing learners the flexibility to remain in their communities or in their duty post. Distance education was and is seen as one of the solutions to training education and health services personnel who are working full-time and who are unable to attend and/or afford to register in full-time residential institutions. It is also seen as a solution to the depleting ranks of teachers and healthcare and other professionals, which have been decimated by HIV/AIDS, as distance education can provide effective pre-service and in-service training programs.

Online courses and courses delivered by videoconferencing, Facebook, or immersion in Second Life may be the rage in countries in North America and Europe, but in Africa a full range of delivery options must be considered. Africa lacks high-speed Internet infrastructures, access to computers, and human resources with the expertise to effectively implement and support hi-tech delivery methods. Thus, in Africa, distance education takes on a variety of forms including paper-based courses, radio instruction, and television broadcasts. The latter forms of media have a broad reach and are accessible to learners who lack tools and technical expertise.

In an effort to initiate and expand e-learning and other technology-based ODL opportunities, Africa may need to be more proactive in addressing the issues mentioned previously in this editorial. Some of these issues are more pertinent in some regions of the continent than in others.

However, progress is being made and will continue to be made as long as leaders and educators can envision a better future for their people, educational resources are provided from limited national and international development budgets, and educators are willing to break away from ineffective instructional methods and embrace methods and technology that can address the real needs and aspirations of their learners.

There are many successful ODL programs across the continent and there are efforts underway that aim to address the challenges of development. This edition of IRRODL presents a snapshot of distance education in Africa; it only covers a few of the many initiatives that have been recently completed or are in progress. Through the use of case studies and research reports, this regional focus issue of IRRODL describes and analyzes current practices, trends, and issues in ODL in Africa thereby showing the actual and potential contribution of ODL to educational development in particular and social and economic development in Africa in general. The articles, which focus on policy, teacher education, and use of new technologies, reveal the challenges and obstacles to ODL's optimal effectiveness, efficiency, and quality assurance.

This edition of IRRODL contains nine articles which are introduced below.

Using classroom video analysis and follow-up interviews, Jean-Marie Muhirwa examines the obstacles to quality interaction between distance learners in Mali and Burkina Faso and their French and Canadian instructors.

Anne Sikwibele and Judith Mungoo explore the challenges faced by students and tutors in a distance program designed to upgrade the academic and professional qualifications of primary school teachers in Botswana.

Bopelo Boitshwarelo documents his failed but instructive attempt to introduce a blended learning professional development program to science teachers in Botswana.

In an evaluative study of a distance teacher education program offered in Ghana, Kwasi Addo Sampong compares performance data obtained from students and faculty/administrators to standards prepared from the program's design.

Two articles present the University of Pretoria's Advanced Certificate in Education (ACE) program: Ruth Aluko focuses on the impact of the distance program on the professional practice of teachers, and Jill Fresen and Johan Hendikz report on the re-design of the program to promote access, quality, and student support.

Jayshree Thakrar, Freda Wolfenden, and Denise Zinn describe models and success factors for the use of open educational resources (OERs) produced by the Teacher Education in Sub-Saharan Africa (TESSA) consortium.

Sushita Gokool-Ramdoos extends the application of transactional distance theory (TDT) to evidence-based policy development in Mauritius in order to understand the implications of distance education (DE) policy deficit.

Finally, returning to Botswana, Alison Mead Richardson analyzes the technical, staffing, and cultural barriers to change when developing technology-enhanced, flexible delivery methods for vocational education and technical training programs.

In order to further the effective implementation of distance education in Africa, future research could be conducted to address the items below.

- What collaborative initiatives would benefit Africa and how can these initiatives be nurtured and maintained? How can diverse cultural, social, and economic needs be addressed in collaborative enterprises?
- What affordable and reliable infrastructure can be implemented in Africa? Can wireless networks be implemented successfully or do land lines and satellite connections still need to be implemented?
- How can distance education be used to develop competency in the development and delivery of distance education? What blended approaches could be effective? What programs would be most effective for various groups such as educational leaders, teachers, technical support personnel, and learners?
- What approaches can be used to ensure gender equality with respect to educational participation and decision making? Currently, few top education and technology leaders are women.
- How can one nurture constructivist and problem-solving approaches to pedagogy rather than the teacher-centred approaches often employed in Africa?
- How can open-access learning materials and tools be implemented and maintained in Africa? Can these resources be localized and integrated into national education systems at a lower cost than developing them locally? Expertise is needed to support such initiatives, and resources are needed to sustain them. Often, initial funding is provided by non-government organizations (NGOs), but once the NGOs cease funding, the initiative dies.
- Since mobile telephones have become ubiquitous in all African countries, how can mobile devices be used effectively to provide or support collaboration, social networking, and interactive learning?
- Often online learning can yield “electronic page turners” in which information is presented digitally, but there is minimum interactivity. How can online courses be designed to be more interactive and encourage learners to learn with and from other learners and their community?
- How can programs be monitored and evaluated effectively? The dispersed population in many parts of Africa and the lack of accessible and reliable telecommunications can make it difficult to monitor and assess distance learning activities.

We sincerely hope that this snapshot of distance education initiatives in Africa will be enlightening and thank Terry Anderson, Brigitte McConkey, the authors of the articles, and the

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Teaching and Learning Against all Odds: A Video-Based Study of Learner-to-Instructor Interaction in International Distance Education

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Abstract

Distance education and information and communication technologies (ICTs) have been marketed as cost-effective ways to rescue struggling educational institutions in developing countries, particularly in sub-Saharan Africa (SSA). This study uses classroom video analysis and follow-up interviews with teachers, students, and local tutors to analyse the interaction at a distance between learners in Mali and Burkina Faso and their French and Canadian instructors. Findings reveal multiple obstacles to quality interaction: frequent Internet disconnections, limited student access to computers, lack of instructor presence, ill-prepared local tutors, student unfamiliarity with typing and computer technology, ineffective technical support, poor social dynamics, learner-learner conflict, learner-instructor conflict, and student withdrawal and resignation. In light of the near death of the costly World Bank-initiated African Virtual University (AVU), this paper concludes by re-visiting the educational potential of traditional technologies, such as radio and video, to foster development in poor countries.

Keywords: Distance education; interaction; interactivity; sub-Saharan Africa; learners' support; Internet connectivity; pedagogy; learning theories; instructional design; traditional media

Research Context

During the sixties and the seventies, classroom interaction analysis became something of a catchphrase in educational research to the point that Tischer (1972) wondered if it had become “a new religion.” It went on a declining path throughout the eighties before it returned to the limelight over the last two decades with the spectacular development of new information and communication technologies (ICTs) and their growing popularity in educational and training settings (Gunawardena, Lowe, & Anderson, 1997; Hannafin, 1989; Hillman, Willis, & Gunawardena, 1994). Most of these research efforts were conducted within similar geographical and socio-cultural contexts in developed or emergent countries. To date, most international distance education (IDE) projects in sub-Saharan Africa (SSA) seem to have been implemented based less on evidence from thorough needs/sector analyses and more on assumptions about their

potential to rescue the battered educational and training systems in developing countries (Assié-Lumumba, 2004; Sy, 2004). Although many policy papers on IDE have been drafted and material and equipment needs highlighted, a thorough investigation into the less tangible aspects of the process of IDE interaction remains scarce at best. IDE brings to bear a number of hidden socio-cultural, historical, political, religious, linguistic, and philosophical distances and assumptions between the two communicating entities that are much harder to bridge than the tangible geographical distances and the ‘digital divide’ that IDE is supposed to bridge (Matthewson, 1994). In his definition of the *transactional distance* between learners and instructors, Moore (1997) argues that the notion of distance in DE is not simply a geographic separation of learners and teachers but is, more importantly, a “pedagogical concept.” As he puts it,

It is a concept describing the universe of teacher-learner relationships that exist when learners and instructors are separated by space and/or by time. This universe of relationships can be ordered into a typology that is shaped around the most elementary constructs of the field – namely, the structure of instructional programmes, the interaction between learners and teachers and the nature and the degree of self-directedness of the learner. (p. 22)

Yet empirical evidence and past research suggest that even in traditional face-to-face teaching and learning situations, teachers have a natural tendency to use their own dominant cultural patterns and references (Heath, 1983), which overlook students’ alternative ways of knowing (Moodie, 2003).

IDE Projects in Sub-Saharan Africa (SSA)

Two decades ago, the spectacular development of ICTs revolutionized many areas of the economy and day-to-day life in developed countries. Expectations ran high in the educational sector not only in developed countries but also in developing countries. Technology-based education and training was deemed to be the most cost-effective, cost-efficient way of solving many of the endemic problems in education and training. Nowhere were expectations higher than in SSA. Donor countries and international organizations advocated “bridging the digital divide” as a developmental and ethical necessity to aid countries in SSA to alleviate poverty. Improving education and training in SSA thanks to the delivery of quality IDE or training programmes from some of the most prestigious institutions in the world was given high priority. The study reported here was conducted in Mali and in Burkina Faso, two IDE program recipients, and in Canada, a program provider. Participants were students, administrators, tutors, and technical assistants from the African Virtual University (AVU) and from the Université numérique francophone mondiale (UNFM).

The AVU

Funded by the World Bank, the AVU pilot project started in 1997. Fifteen higher education institutions (mostly Anglophone) participated in the initial phase. The AVU's stated lofty goal "to contribute to efforts to improve education in Africa by harnessing the power of modern information and communication technologies and to position Africa in the wider knowledge society" triggered some controversy (see Amutabi & Oketch, 2003; Munene, 2007). From its head office in Washington, the AVU delivered various undergraduate and short capacity-building programs from Western universities to participating universities in SSA. During its two initial phases, it used a TV-like studio fully equipped to produce multimedia content (text, still images, audio, and video). The delivery system comprised a combination of satellite and Internet technology to allow a one-way transmission of courses.

As of 2003, the AVU transitioned from a World Bank project based in Washington to an African intergovernmental organization headquartered in Nairobi (Kenya). Programs in computer science, in journalism, and in business administration from Western universities were delivered to higher education institutions in SSA via an Internet delivery platform (Interwise), using satellite antennas. French-speaking countries jumped on the AVU bandwagon in 2005. More than a dozen higher education institutions subscribed to a bachelor's program in computer science offered by a Canadian higher education institution through the AVU.

The UNFM

Mali and Burkina Faso were two particularly interesting research sites. Coincidentally or not, the UNFM was launched three months prior to the beginning of the AVU's bachelor's program in computer science in these two former French colonies. Targeting francophone higher education and training institutions, the UNFM initiative was stewarded by Cheikh Modibo Diarra, the Malian astrophysicist whose contract as AVU's CEO had been abruptly terminated. The UNFM was co-funded by the Fondation pour l'innovation politique (Fondapol), a French foundation and think tank, and the Pathfinder Foundation for Education and Development, created by Dr Diarra. The clear intention that motivated the creation of the UNFM was to position it as a competitor to the AVU (Loiret, 2005). The UNFM pilot project offered training sessions in tropical medicine to in-service nurses in Mali and in Burkina Faso.

The Delivery Method

The most conspicuous peculiarity of IDE programs destined to SSA is the fact that given the poor infrastructure and lack of ICT equipment within African households the "anytime, anywhere" slogan could not apply. Registered students had still to commute to campuses. In the case of the AVU, when the Internet connection was good, courses consisted of synchronous lectures delivered from Canada. Although the narrow Internet bandwidth did not allow the lecturer's image to be displayed, learners could hear the tutor's voice synchronously while he or she explained PowerPoint slides projected onto a screen situated on the front wall in the classroom.

Using a hand-like pointer, lecturers could underline, circle, or point to particular items on the slide while explaining course materials. The learners could interact with lecturers using a headset with a microphone, which was connected to the one computer in the classroom. Thus, they could ask questions or answer the tutors' questions synchronously. Given frequent instances of Internet disconnections or power outage, the synchronous version of the delivery was backed up by a WebCT site, where students could find course materials they missed.

The UNFM's delivery system was slightly different. One reputable French health institution provided and delivered lectures. Although students could see their instructors on the screen and hear their voices, no means for oral feedback were provided. As one participant put it, "We watch as if we were watching a TV show." Students could only interact with their distant instructors by typing in their questions or answers using the one computer in the classroom.

This was also the solution AVU students resorted to in the many instances of poor sound quality due to the narrow Internet bandwidth. Given the combination of students' awfully poor typing skills and the novelty of the subject matter, even short interactions with distant tutors would take disproportionate amounts of time and be subjected to numerous distortions. In the case of the UNFM, when the connection did not allow either form of oral or written interaction, back up CD-ROM copies were sent by mail to the students. It could take a few weeks before students got acquainted with the learning materials.

Research Questions

This study explores the interaction process between two groups in IDE contexts, namely lecturers from developed countries (France and Canada) and their students in SSA, who are separated by geographical and other differences, including cultural and linguistic. Given the fact that past studies of interaction focused mostly on interaction within similar cultures on the one hand and the various distances involved in IDE on the other hand, studying international teacher-learner interaction would contribute to the understanding of some of the most important aspects of IDE. According to Yacci (2000), educational interaction is a message loop from the learner's point-of-view, which has two outputs, content learning and affective benefits, and mutually coherent messages from both sides.

Using a triangulation of quantitative and qualitative analysis from video analysis of classroom interaction and follow-up, in-depth interviews with teachers, students, and local tutors, this study analyzed lecturer-to-learner interaction and how it influences learner-to-learner and learner-to-local tutor interaction.

The following questions guided the study:

- What are the main obstacles to quality instructor-to-learner interaction in IDE destined to SSA?
- How do these obstacles impact learner-to-learner and learner-to-local tutor interaction?

Given the scarcity of sound theoretical and empirical foundations to inform policy makers, administrators, and IDE practitioners, it is hoped that findings from this study will be a worthwhile contribution to the understanding and, ultimately, the improvement of IDE.

Theoretical Framework: Interaction, Interactivity, and Socio-Cultural Theory of Learning

Over the last two decades, the rising tide of new information and communication technologies (ICTs) gave impetus to an increased interest in studying interactivity, and this created confusion between *interaction* and *interactivity*, especially in educational and training settings (Reeves, 1999). Although the latter is more related to technology-based communication, the former is more encompassing. It can be applied to computer-based communication (as in human-computer interaction or voice-to-machine interaction) as well as to more traditional forms of human communication. But the two concepts are commonly used interchangeably.

Moore (1989) has classified interaction according to the nature of the entities involved in the interaction process. He identified three main types of interactions: learner-to-instructor interaction, learner-to-learner interaction, and learner-to-content interaction. Because computer-mediated communication plays an important role in DE, Hillman, Willis, and Gunawardena (1994) later underscored the importance of learner-to-interface interaction.

The seminal work of Vygotsky (1978) was an important contribution to the understanding of the role of interaction in children's learning. Vygotsky theorized that learning consists of a dialectical process of problem-solving experiences shared with someone else (parents, teachers, or peers) through interaction. Subsequent research efforts confirmed how teacher-to-student interaction plays a paramount role in learning and academic achievement (Heath, 1983; Rogoff 1995). Further research pertaining to DE concurred that quality interaction plays a crucial role in students' learning, achievement, satisfaction, and participation (Fulford & Zang, 1993; Insung, Seonghee, Cheolil, & Junghoon, 2002).

More recently, Kress (2003) espoused the socio-cultural theory with respect to new technologies. He argued that technologies are culturally and socially bound modes of representation and communication. In order to convey meaning in specific cultures, their affordances are subject to syntax and grammatical rules that make them understandable in the culture of local people. According to Kress (2003), "Cultures work with these material affordances in ways which arise from and reflect their concerns, values and meanings." (p. 45). This is consistent with the Vygotskian socio-cultural theory of learning.

Learning Styles

Socio-cultural learning theory underscores how culture and cultural artefacts teach people what to think and how to think by providing them with *tools of intellectual adaptation*. Thus, they play an

important role in shaping students' learning styles. For example, students from SSA, arguably the most oral culture in the world, will be more likely to learn through oral interaction than their Western instructors who were shaped by a more visual culture. As a consequence, instructors and learners will face a learning style mismatch, which, if not addressed, will hinder learning. As Jorgensen (2006) puts it, when it comes to learning in diverse or cross-cultural contexts, "one size does not fit all."

Multimedia Learning Theories

One of the most remarkable features of multimedia learning is the potential it offers to use both auditory and visual modalities to convey meaning and enhance learning. Taking into account the constraints of working memory and its complex relationship with long-term memory during the process of retrieval, storage, and retention of information for learning purposes, cognitive psychologists have developed a number of theories that enunciate the guidelines for optimal integration of verbal and visual information for learning. Over the last thirty years, multimedia-learning theories have contributed to the improvement of our understanding of conditions under which the design and delivery of learning materials can be successful. For example, according to dual-coding theory (Clark & Paivio, 1991), presenting information both in visual and verbal forms enhances learning and recall. Cognitive load theorists (Leahy, Cooper, & Sweller, 2004; Sweller, Van Marriënboer, & Pass, 1998) further posit that problem-solving and learning are enhanced or impaired depending on how cognitive resources are focused and used according to the limited processing capacities of working memory. As Chandler and Sweller (as cited in Leahy, Cooper, & Sweller, 2004) summarize, "Traditional methods of instructional design based upon visual elegance, common sense, and convenience are rendered ineffectual" (p. 91). In the following pages, I analyze to what extent this body of theoretical frameworks has been taken into account in the design and the delivery of IDE projects in SSA.

Methods

Data Collection

The set of data used in this study was collected from December 2005 to February 2006. Participants were university students from Mali and Burkina Faso taking an undergraduate IDE programme in computer science offered by a Canadian higher education institution and an in-service nurse training programme in tropical medicine offered by one French health institution. Prior to undertaking the fieldwork, I had the opportunity to live and work in Mali and Burkina Faso. Thus, I had a chance to witness the early implementation stages of the two IDE projects in both countries. I created rapport with potential participants for twenty months prior to the beginning of data collection. Data were videotaped using a Sony DCR-TRV 510 Digital 8 video camera equipped with a sensitive built-in microphone and a foldable 5-inch colour screen monitor. The fact that the camera was equipped with a night shot option that provided perceptible black and white images even in very low luminosity was very helpful. Most of the time, dark

curtains had to be closed in order to allow the students a better view of the PowerPoint slides or images on the central screen in their classrooms.

Twenty hours of Hi 8 videotape footage were recorded. A headset was used to monitor sound quality. The video and tape recorder functioned on battery most of the time. This allowed me more freedom to move around if necessary while reducing obtrusiveness. In order to preserve participants' anonymity, the video camera was placed on a tripod in the back of the classroom. The camera position, shooting from the back with the learners in the foreground while at the same time showing the lecturers' actions on the screen at the front of the classroom, was consistent with this study's focus on lecturer-to-student interaction (Erikson, 2006). Various camera movements (zoom in/zoom out; right/left panels) allowed me to focus on any point of the classroom where the interaction was happening. After shooting, the more significant instances of interaction were selected and shown to small groups of three or four students on my MacIntosh PowerBook G4 laptop computer screen, which was connected to the camcorder by a firewire cable. Students' comments were recorded on audiocassettes. The same procedure was used with lecturers in Canada.

Data Analysis

This study followed a "whole-to-part" or inductive approach to video data analysis (Erikson, 2006; Nastasi, 1999). The 20-hour (72,000-second) videotaped materials were reviewed in real time on a PowerBook G4 laptop computer screen connected to a TRV 550 Sony camcorder by a firewire cable. Clips of interactions relevant to this study's research questions were isolated and saved in Quick Time video format in such a way as to allow further analysis using HyperResearch, a qualitative analysis package.

Given the frequent Internet disconnection and power failures, the continuous clock feature provided complementary information about time lapses between disconnections or power outages. Following Erikson's (2006) inductive procedure and Nastasi's "videotaped critical incident" approach (1999, p. 23), instances of interaction located during the first integral viewing were isolated and saved in QuickTime Player format, which was compatible with HyperResearch.

Given this study's research questions, all instances of tutor-to-learner interaction during the recorded 20 hours were considered as "videotaped critical incidents" to be further analyzed. Straight lectures with no observable lecturer-to-learner interaction were not considered for analysis.

Results

A Quantitative Overview

The first step of the analysis consisted of establishing a quantitative overview of the interaction time. Table 1 below illustrates the results from a preliminary analysis yielded by the time code

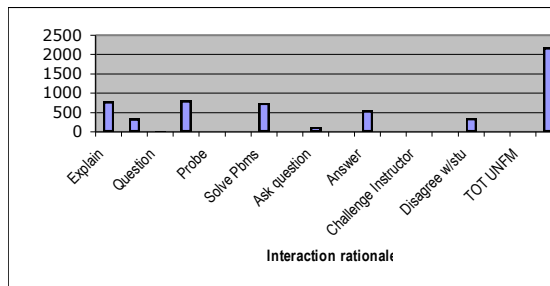
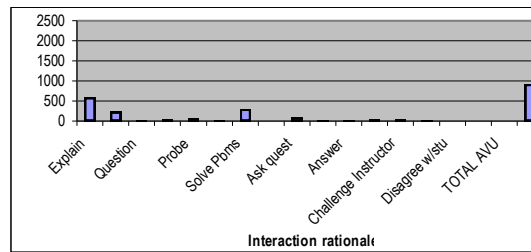
counter and the camera clock readings from the selected video clips. It shows that during 20 hours, there were little more than 28 minutes of instructor-to-learner interaction at the AVU (1,721 seconds or 2.3% of the interaction time) and 69 minutes at the UNFM (4,147 seconds or 5.7% of the interaction time). In addition, Internet disconnections stand out as the main challenge to lecturer-to-learner interaction. With respectively 1.2% and 3% at the AVU and at the UNFM, the Internet connection problems occur more often than any interaction. The table shows also that most of the time lecturers use the very limited interaction opportunities to instruct more or to allow students to explain (1.1% for the AVU and 1.4% of the time at the UNFM).

The overall students' participation is limited to a mere 0.4 % of the interaction time for the AVU and 1.3% for the UNFM. Furthermore, these results show that part of this precious interaction time is wasted in disagreement between students (0.3% of the time at the AVU and 0.4 % at the UNFM).

Table 1

Mean and Percentage Duration for Interaction Events (20 Hours Video-Recorded)

IDE Project	WHO	Interaction rationale	Duration (sec)	Percent		
AVU	Instructor	Explain	583	0,8		
		Instruct	231	0,3		
		Question	29	0		
		Answer	34	0		
		Probe	62	0		
		Repeat	23	0		
		Solve Pbms	299	0,4		
		Total Instruct	1261			
	Student	Ask quest	92	0,1		
		Repeat quest	17	0		
		Answer	14	0		
		Silence	30	0		
		Challenge Instructor	41	0		
		Disagree w/ instructor	7	0		
		Disagree w/stu	259	0,3		
		Total Stud	460			
		TOTAL AVU	1,721	2,3		
		Internet disconnect	918	1,2		
		UNFM	Instructor	Explain	781	1
				Instruct	332	0,4
Question	16			0		
Answer	802			1,1		
Probe	0			0		
Repeat	0			0		
Solve Pbms	744			1		
Total Instruct	3,135					
Student	Ask question		122	0,1		
	Repeat quest		0	0		
	Answer		546	0,7		
	Silence		0	0		
	Challenge Instructor		0	0		
	Disagree w/ instruct		0	0		
	Disagree w/stu		344	0,4		
	Total Stud		1,012			
	TOT UNFM		4,147	5,7		
	Internet disconnect		2181	3		



Qualitative Analysis

The coding process used the HyperResearch qualitative analysis package. Its video analysis feature allows the analyst to select parts of the video materials under scrutiny and assign them codes. Particular aspects of interaction consistent with the research questions were thus selected and coded. The main findings from qualitative analysis of the video footage largely corroborated the quantitative findings. They are discussed below.

Internet Connectivity

There are numerous consequences to the very high frequency of Internet disconnections the quantitative data showed above. They result in a variety of interaction problems such as poor sound quality, poor PowerPoint slides or image readability, long question-response lag time, question-answer overlap, or numerous repetitions before students or teachers make themselves understood. These technology-related problems impair instructor-to-learner interaction. Even during those periods when the Internet connection is supposed to be working, its narrow bandwidth does not allow clear instructor-to- learner communication. This results in a waste of time, and sometimes signs of frustration if not exasperation from both students and instructors are observable. Consider the following exchange between the AVU computer science instructor and one of his students in Ouagadougou:

1. Student: There is another question... When you have a polynomial function and...
[cut off]
(15 sec 12)¹
2. Instructor: What kind of function do you want to find?
(18 sec 10)
3. Student: If I have a polynomial function... [Cut off]
(19 sec 38)
4. Instructor: Do you want to find it in MathLab²?
(20 sec 11)
5. Student: No, no, Monsieur. It does not have anything to do with MathLab
(16 sec 23)
6. Instructor: IS IT A FUNCTION IN MATHLAB OR...?
(13 sec 56)
7. Student: IT HAS NOTHING TO DO WITH MATHLAB, MONSIEUR
(13 sec 39)
8. Instructor: Okay...
(10 sec 34)
9. Student: When I have a polynomial function...[Cut off]

¹ Time is expressed in minutes, seconds, and one-hundredth of seconds. The time between brackets represents the response lag time when it is situated between two lines of replies. It represents the duration when situated at the end of the reply. The duration was not mentioned for short replies of less than 10 seconds.

² A programming language that is believed to be faster than traditional languages such as C and C++.

- (15 sec 19)
10. Instructor: YES, GO ON. I'M LISTENING TO YOU ...
(17 sec 26)
11. Student: And then I want to derive two other functions from the original functions...Is that all I need? (20 sec 14)
12. Instructor: Yes, that's all you need... It depends on what you want to do with the function [...] Have I answered to your question? (5 min 25 sec 19)
(9 sec 58)
13. Student: Yes, Sir. Thank you very much.

As the excerpt shows, the quality of synchronous online communication is very poor. It took eleven replies and almost three minutes (178 seconds) before the instructor understood the question he was being asked. Sometimes, the Internet connection was so bad that IDE lecturers would have no other choice than to stop teaching altogether even though the Internet was supposed to be working.

The capitalized replies in the excerpt above stand for a heightened tone of interaction betraying frustration or exasperation, which poorly serves content learning and affective benefits, the necessary outputs of educational interaction (Yacci, 2000). This situation does not sit well with multimedia learning theories, dual coding theories, and the importance of quality feedback from students' questions, discussed earlier in this text. Moreover, these technology-related problems were predictable. It is well documented that the African continent remains the most unwired part of the world. For example, although Africa has approximately 12% of the world's population, it has only 2% of the global telephone network (Darkwa & Mazibuko, 2000). In addition, most of its internal communications (video, voice, data) have to transit through Western countries, rendering the cost of communications more expensive than anywhere else in the world, and this is particularly true for higher education institutions, as explained by Gakio (2006):

The average African university has bandwidth capacity equivalent to a broadband residential connection available in Europe, pays 50 times more for their bandwidth than their educational counterparts in the rest of the world, and fails to monitor, let alone manage, the existing bandwidth for educational purposes. As a result, what little bandwidth that is available becomes even less useful for research and education purposes. (p. 3)

This technological landscape makes the kind of synchronous IDE instruction offered by the AVU and the UNFM seem inappropriate in SSA.

Poor Pedagogy and Human Touch

In addition, instructors appear to be unprepared to handle this kind of situation. For example, as mentioned earlier in this text, students at the UNFM could only listen to and watch their lecturers on the screen without any possibility to interact with instructors orally. This does not make them less vulnerable to the poor quality of the Internet connection, and their instructors do not seem better prepared to handle the situation than AVU instructors. Confronted with a technical problem, which prevented her from showing the PowerPoint slides that constituted her only teaching material, one UNFM instructor candidly told her students,

I am a little bit... I do not even have a print copy to back me up.
I am a bit... I am speechless... This problem will be fixed! We will fix it! So, while we are trying to fix this problem, you can use this time to discuss health policy matters in your two countries. (Tape #1, UNFM Bamako, 14/12/2005, Time Code: 11:16:18 -11:18:31)

As the video footage shows, it took 38 minutes before the problem was fixed. From this point on, in an attempt to catch up on time, the instructor used the remaining 23 minutes for a straight lecture with no interaction whatsoever with the students. As a result, the learners did not seem to pay any attention to the lecture. Some of them were chatting; others took a nap or played with computer screens sitting in front of them. Only a few struggled to follow the straight lectures when the Internet connection allowed it. UNFM students in Bamako deplore the pedagogic situation as follows:

Au niveau pédagogique nous trouvons des faiblesses notamment en dispensation des cours magistraux par des professeurs occidentaux. Pas de dialogue direct entre formateurs et formés; pas d'encadreurs du côté malien sur le terrain.

[On a pedagogic level, we find weaknesses in the way foreign lecturers carry out their DE teaching. There is no direct interaction between the lecturers and the students and there are no local tutors in Mali. (Focus group interview, Bamako, 15/12/2005)]

The lack of local tutors is one of the students' most serious preoccupations in the two IDE projects. Yet, DE literature insists on the importance of the tutor in the student support process (Dhanarajan, 2001; Lentell, 2003). In Ouagadougou, UNFM students share the same view as their counterparts in Bamako but they emphasize "le manque de chaleur humaine entre enseignants et enseignés" [the lack of human touch between students and their instructors].

The lack of social presence and human touch is a problem that has dogged online DE for many years. Even in developed countries' learning environments, more attuned to individualism, Gunawardena and Zittle (1997) suggested that social presence is a predictor of learners'

satisfaction in online learning environments. This can be assumed to be even more the case with students from SSA, who are familiar with a collective lifestyle within extended families in villages and in urban settings.

Some AVU students liken their lectures to “listening to the radio with a high level of interference” [C’est comme écouter la radio avec beaucoup de parasites]. One AVU official goes even further in deploring the pedagogic approach taken by his institution and warns against its dire pedagogic consequences on students’ learning:

There is an unfortunate and ultimately damaging perception that the process of developing e-Learning simply requires that existing teaching materials (usually antiquated lecture notes) be digitized and put online. This ‘digital dumping ground’ will result in the development of extremely poor quality online teaching and learning and will contribute nothing to higher education in Africa nor to the AVU’s mission. (Bateman, 2004, p. 5)

Students’ Unfamiliarity with Technology and Poor Support

At the UNFM, students can interact with their instructors only by typing their questions or answers. This is also the case at the AVU in the many instances when the sound quality is too poor to allow synchronous oral communication. One instructor with exceptional typing skills says sound problems forced him to practice a mixed form of communication with his students. He frantically types in every word he utters. He says this form of interaction is less frustrating for him and for the students, especially when sound quality is poor. Students say they appreciated this instructor’s strategy.

Nonetheless, this brings to the fore the problem of students’ poor typing skills. For example, it took 145 seconds (more than two minutes) for UNFM students in Bamako to type the following three short questions (23 words):

- Qu’est ce qu’un vaccin thymo-indépendant? [What is a thymo-independent vaccine?]
- Qu’est ce qu’une valence vaccinale? [What is a vaccine valence?]
- Que veulent dire les procédures de contrôle de qualité vaccinale? [What do vaccine quality control procedures mean?]

The typing speed of UNFM students could be estimated at 9 words-per-minute (WPM). Given this poor typing performance, the fact that at the UNFM instructor-to-student interaction happens only in writing could explain why it looks like the UNFM has more than twice the interaction time at the AVU (see Table 1 earlier in the text).

At the AVU in Ouagadougou, it took one student 153 seconds to type in the following 18-word definition of the exploitation system of a computer:

“Un système d’exploitation est utilise pour gérer des logiciels, piloter l’ordinateur, gérer l’interface entre l’utilisateur et le materiel.”

[An exploitation system is used to coordinate software, pilot computer, and manage the interface between the computer and its user.] (Figure 1 is an illustration of this episode.)

This performance of 7 WPM is even lower than that of the UNFM. But contrary to the UNFM, most AVU instructors do not rely exclusively on written interaction. They give precedence to oral interaction despite its numerous problems.

Karat, Havelson, Horn, and Karat (1999) estimate that the performance of the average computer user is 33 WPM for transcription and 19 WPM for composition. Isokoski and Linden (2004) found that working in a foreign language lowered text transcription performance. They documented that Finnish people were 16% slower and made more typing errors while typing English than while typing Finnish. This phenomenon might be at play with students from SSA. Although they have a good command of the French language, Voltaire’s language remains foreign to them.

In addition, the majority of IDE students confessed they had the opportunity to use a computer keyboard for more than half an hour for the first time when they started their IDE program. Taken together, these considerations might explain why IDE students in SSA have less than half the typing performance of the average computer user.

More importantly, from a pedagogy standpoint, it should be noted that the questions and answers above belong to the lowest levels of Bloom’s Taxonomy of Educational Objectives (1956). They are about *knowledge* and *comprehension*. Thus they fall short of addressing the higher levels of *application*, *analysis*, and *synthesis* that professionals in SSA need so badly.

Poor Social Dynamics, Dominance, and Arrogance

The interaction problems discussed above have a negative impact on classroom social dynamics and collaboration. The fact that there is only one central computer equipped to allow lecturer-to-learner interaction in each classroom triggers competition among the students for control of the interaction process. Lecturers do not seem to question the fact that they interact with the same few students over and over. These self-appointed students ask questions or answer the instructor’s questions as if they were mandated by their classmates to do so, which is far from being the case.

At the UNFM and at the AVU, a small group of two or three students sits around the central computer and controls the interaction tools connected to it, such as the microphone, the headset, and the keyboard. This dominant group of students impose themselves on the rest of the class. At

the AVU and at the UNFM, all the dominant students are men. They had some familiarity with the use of computers before they started the IDE program or they were sophomores. In the absence of local tutors to moderate the interaction process, this group of students behaved as if they were the legitimate class representatives.

They set up the central computer either in the front row or in the back of the classroom (see Figure 1) and they seemed not to care about the opinion of the rest of the class. They did not allow their classmates the time necessary to ask questions or clarify their answers. The rest of the class seemed resigned to the situation, but sometimes there were sparks of disagreement and conflict.

Learner-to-Learner Disagreement/Conflict

Sometimes dominant students' arrogance sparked verbal arguments or gestures such as microphone grabbing. Consider the following interaction from the video footage:

- | | |
|--|--|
| 1. Instructor: | Is... Is...the explanation clear? |
| 2. Dominant student 1: | Yes, sir, it is very clear. Thank you! |
| 3. Female student: | No, it is not. I have a question... |
| (Speaking to dominant student 2): | I wanted to ask him [the distant instructor] if he could demonstrate (...)
[The group of dominant students cut her off] |
| 4. Group of dominant students (in chorus): | Yéééééééé + disapproving murmurs
from the rest of the class |
| 5. Female student (protesting and frustrated): | WHAT? DON'T I HAVE THE RIGHT
TO ASK A QUESTION? (Tape 3, AVU Bamako, 16-12-05) |

The female student's comments are followed by more murmurs. Apparently frustrated, the female student bounced back on her chair, pulled her veil over her face, and withdrew. The disagreement above lasted one minute and a half. Oblivious, the distant instructor carried on with his lecture. In Bamako, nobody was listening to him. Students were busy arguing. The same thing happened in Ouagadougou. Students argued without paying attention to the lecture that was going on. Sometimes, instead of arguing, students who had something to say to the instructor would walk towards the central computer, grab the microphone from the hands of one of the dominant students, and ask their question. This happened a few times after one of the dominant students had misinformed the instructor that everything was clear and there were no questions.



Figure 1. A partial view of the DE classroom setting at the AVU-Ouagadougou in Burkina Faso, where a student is typing an answer.



Figure 2. A partial view of the DE classroom setting at the UNFM-Bamako in Mali.

Learner-to-Instructor Disagreement: Withdrawal and Silent Resignation

One student stepped forward to the microphone to ask the following question:

1. Student: How could you perform this operation with MathLab?
2. Instructor: Yes, you could perform it with MathLab.

This laconic answer triggered laughter, and the students' body language expressed scepticism. Because of the long response lag time, the answer from the instructor came when the student who had asked the question was already walking back to his seat. He threw his hands in the air in discouragement. He turned around and came back to grab the microphone from one of the dominant students:

3. Student: How?... How? Please, sir...
The instructor attempted an explanation that lasted 3 minutes and 31 seconds.
4. Instructor: You could do the operation with MathLab if the two operations are compatible (...) Have you understood?
5. Student: We didn't understand a thing, Monsieur. That was too fast.
The explanation that followed lasted 15 minutes and 25 seconds
6. Instructor: In MathLab for example (...) Is it clearer now?
7. Student: Yes, sir, it is clearer.

Despite this answer, the body language of the majority of the students continued to suggest otherwise (disapproving head shaking and index finger waving). While the student interacting with the instructor was busy reassuring the instructor that his explanations were clearer, the disagreement between students became raucous. Many students angrily voiced their frustration and blamed the student who had interacted with the instructor for misrepresenting their opinion. A few students supported him. The distant instructor who did not have a clue about what was going on in the classroom in Ouagadougou was content with his interlocutor's feedback and carried on to the next activity.

Questioning Local Tutors' Preparedness and Students' Collaboration

At the UNFM, although there is no direct oral instructor-to-learner interaction, disagreements occur most times during the loud reading of written answers from instructors. The following exchange happened between one female student and the local tutor:

1. Female student: You are reading too fast. We do not understand what you are reading.
2. Local Tutor : WHAT ARE YOU COMPLAINING ABOUT? I AM TRYING TO HELP YOU OUT AND YOU FIND MATTER TO COMPLAIN ABOUT!

3. Female student: (inaudible but apparently protesting) (UNFM Bamako, tape 1bis, 10 :12 :55 am)

Although the UNFM training program targets in-service professional nurses, it is important to point out that the so-called 'local tutor' involved in the exchange above was a recent graduate from the local engineering school! By his own admission, he did not understand many of the medical concepts and terminology used in the courses. Thus, his role was reduced to helping students to use the central computer when typing in their questions and/or answers and reading answers to students' questions from the distant instructors.

At the AVU campuses in Mali and in Burkina Faso, the few available local tutors are graduate students in computer science. From a theoretical point of view, they are well qualified to support students in their learning task. But, as the following student-to-local tutor interaction episode shows, they are not always willing to help students:

1. Instructor (from Canada): What is an exploitation system?
2. Student 1 (to local tutor): The question is addressed to you, Monsieur
3. Local tutor (protesting): Oh no! The question is addressed to you, students!
4. Student 2:
We do not know Monsieur. We came here to learn about it.

How are we supposed to know before we learn about it?
5. Local tutor: Ah, too bad for you if you do not know! I... I... the question is addressed to you...
6. Instructor (from Canada): I am still waiting for your answer...

As revealed in many other episodes, students seemed to enjoy challenging their local tutor. Overall, this interaction episode mobilized students' attention for 4 minutes and 23 seconds. During this time, one student was bending over the computer keyboard in the back of the classroom struggling to type in a written answer (see Figure 1). A few classmates who were paying some attention to his efforts came up with contradictory suggestions to assist him. Some mocked his spelling mistakes. Rather than helping, these actions contributed to confusing him and slowing down his composition efforts and WPM counts.

This episode highlighted the extent to which local tutors seem ill-prepared and poorly motivated to handle their important student support, facilitator, and mediator roles. What is more, they had no interaction whatsoever with the distant instructors, whose teaching they were supposed to complement in the field. The episode related above happened after the settlement of a work dispute that forced the AVU management to pay arrears to in-service local tutors and to hire more local tutors.

The Way Forward

Sound Pedagogy instead of “Technological Silver Bullets”

Findings from this study have shed light on some of the reasons why IDE projects have failed to live up to their lofty promises of cost-effectiveness, cost-efficiency, and economy of scale in SSA. Despite the remarkable potential of IDE to improve learning when informed by learning theories and principles of instructional design, results from this study show how disregard for these factors resulted in technological, pedagogical, administrative, and political problems that crippled instructor-to-student interaction and thus the learning process. The low success rate and high attrition rate within IDE projects in SSA are two eloquent indicators of their poor performance. For example, the success rate of the first AVU cohort in computer science at the AVU was as low as 37% (Latulippe, 2004) and only 36% (18 out of the 50) of in-service professional nurses who had registered at the UNFM Ouagadougou in 2005 managed to graduate in 2007 (Ilboudo, 2007).

These numbers are consistent with the drop-out rate in developed countries. The worst estimations contend it is as high as 70-80% (Flood, 2002), the most conservative downplay it to 10-20% higher than on-campus learning (Carr; Frankola, 2001). Considering Tinto's contention (1982) that on-campus attrition has held constant between 40-45% over the last century this brings the conservative drop-out figure in developed countries to somewhere between 50-65%.

In addition, according to Frankola (2001), most of the reasons invoked by online learners from developed countries for dropping out are strikingly similar to the ones highlighted throughout this study: lack of time, lack of student support, lack of management oversight, poorly designed courses, substandard/inexperienced instructors, and individual learning preferences.

However, given the number of additional technological, socio-economical, political, and cultural challenges highlighted in this study, the similarities between online learning in SSA and in developed countries might be misleading if it is not situated in its systemic political and ideological landscape. Although it is important to salute some genuine success stories that have helped people in developing countries tremendously over the last half century, most foreign aid-funded projects in SSA seem to be designed and implemented according to donor countries' "massive assumptions" (Foster, 1967) and self-interest (Easterly 2007). Thus, although they are poorly accountable, they tend to inflate their outcomes and "tell performance stories" (Mayne, 2004), which seems to have been the case with IDE projects in SSA (Asunka, 2008; Muhirwa, 2008). For example, the AVU continued to paint a rosy picture of its performance and prospects in SSA despite its numerous weaknesses and the recent interventions by funders to resuscitate it.

Findings from this study are consistent with the conclusions reached by the Working Group on Canada's Policy with Regard to Agricultural Biotechnology and Developing Countries (2005). While recognizing the potential of science and technology to foster the development of SSA, the Working Group issued this warning:

As with most interventions, however, “context” is everything. If new technologies are introduced into a foreign environment in the absence of a clearly understood demand and careful preparation (...) there is every risk that the tool will take priority over the purpose. (p.1)

Revisiting the Educational Potential of Traditional Technologies?

It appears that history has repeated itself. Head (1974) deplored how costly technical equipment siphoned the lion’s share of funding destined to the development of radio in SSA to the detriment of research on its remarkable educational and social mobilization potential. More than three decades of hindsight give ample credibility to Berman (2008) when she argues the following:

Instead of merely transposing western approaches to distance education in developing countries, the developed world can learn from uses of radio in developing countries, and that the medium deserves greater attention as a means of giving educational opportunity to rural, isolated people worldwide. (p. 1)

This argument echoes my own experience. While growing up in the African Great Lakes region during the seventies and eighties, I had the privilege to witness first-hand the huge audience for radio dramas such as the *Kapalata* series, broadcast in Swahili from Radio Bukavu (South Kivu province, DRC), *Ninde?*, and *Ikinamico*, broadcast respectively by Radio Burundi and Radio Rwanda. The plots of these dramas would linger for weeks, feeding conversation, amusement, or argument at school, in the fields, or at social gatherings. Unfortunately, this potential was hardly exploited in any meaningful manner to address the myriad of development problems that plagued the region. In 1994 the world was horrified to learn how devilishly efficient a hate radio campaign was in fuelling the killings during the Rwandan genocide. In just three months, hundreds of thousands of Rwandans had been killed. More recently and in much less tragic circumstances, I witnessed the extent to which radio was an incomparably efficient tool for public education and social mobilization while working as media, advocacy and research coordinator for a Canadian International Development Agency (CIDA)-funded project to fight against child trafficking in Mali, Burkina Faso, Guinea, and Côte d’Ivoire.

With political will, pedagogy, instructional design know-how, and only a fraction of the resources dedicated to ICT-based IDE, it would be possible to transform traditional media such as radio and video into productive educational technologies in SSA and in oral cultures around the world.

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The Impact of an Advanced Certificate in Education (ACE) Program on the Professional Practice of Graduates

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Abstract

This paper examines the impact of a distance education program offered by the University of Pretoria, South Africa, on the professional practice of teachers. A pilot study was conducted using a combination of surveys and focus group interviews. Findings reveal that the program was beneficial to graduates' personal development, professional practice, schools, learners, and colleagues. Further, principals who participated in the study attested to the differences they observed between the graduates and other teachers who had not been exposed to such a program. Suggestions for improvements included the introduction of subjects taught at school as areas of specialization, involvement of school principals in the assessment of enrolled students, visits to schools by the organizers, and exposure of students to the practical opportunities offered by the program (with portfolios that could be a part of the assessment).

Keywords: Distance Education; program evaluation; impact analysis; summative evaluation; formative evaluation

Evaluating the Effectiveness of Distance Education for Teacher Development

Distance education methods have been used to teach, develop, and support teachers for many years (United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2001) and the fact that distance education is effective is well recorded. Its numerous advantages are confirmed partly by the demand for continuing education for teachers in a changing world and by the shift of attention from quantity to quality by policy makers and planners (Robinson & Latchem, 2002). However, it is only by systematically evaluating the effectiveness of distance education that one can justify the use of such programs for teacher development and continue to develop their quality (Lockee, Moore, & Burton, 2002). Reasons for evaluating training programs include the need to decide whether to continue offering a particular training program, the need to improve future programs, and the need to validate the existence and jobs of training professionals (Kirkpatrick, 1994).

Moore (1999) claims that one of the few generalizations that can be made about any distance education program is that a good monitoring and evaluation system is key to its success. Furthermore, measuring educational outcomes is a useful way to assess how public service programs are working in the greater public interest (Newcomer & Allen, 2008). Thus, this research study focuses on determining to what extent the Advanced Certificate in Education (Education Management) program under investigation reflects its outcomes as determined by the country's national Department of Education. Although evaluating distance education programs is quite challenging due to the complex nature of the infrastructure and the array of personnel involved (Lockee et al., 2002), the data collected from such evaluations may be used to re-design a program, which may include attitudes towards it as well as learning outcomes (Cyrus, 1998).

Measuring the success of any educational program has been recognized as being an important and fundamental form of institutional accountability; however, research on the impact of distance education programs is sparse (Fahy, Spencer, & Halinski, 2007). A survey of the literature shows that most work in this area focuses on individual aspects of the mode of delivery, for instance on the impact of new technologies on distance learning students (Keegan, 2008). Very few studies focus on the totality of a program or in particular on the professional practice of teachers (Stols, Olivier, & Grayson, 2007). This study seeks to make a contribution towards addressing this gap in the field.

Evaluation is one of the ten steps that should be carefully considered when planning and implementing an effective training program (Kirkpatrick, 1996). Various models have been suggested for evaluating training programs, some from decades ago and some more recent. Kirkpatrick's model is the oldest and has been the most reviewed since its inception in 1959 (Naugle, Naugle, & Naugle, 2000). Many more recent models may be considered to be variations thereof (Tamkin, Yarnall, & Kerrin, 2002). Kirkpatrick's (1996) model has four levels: reaction, a measure of customer satisfaction; learning, the extent to which participants change attitudes, improve knowledge, and/or increase skills as a result of attending the program; behaviour, the extent to which change in behaviour has occurred because participants attended the training program; and results, the final results achieved due to the participants having attended the program, which may include, for instance, increased production, improved quality, and decreased costs.

Kirkpatrick's model is capable of reducing the risk of reaching biased conclusions when evaluating training programs (Galloway, 2005). Although the model has been in use for decades, scholars have criticized it for its over-simplification of what evaluating training programs involves and its lack of consideration of the various intervening variables that affect learning and transfer (Tamkin, Yarnall, & Kerrin, 2002; Reeves & Hedberg, 2003). Aldrich (2002) remarks that it focuses only on whether outcomes have been achieved. In order to address these limitations, Clark (2008) suggests that the model should have been presented by Kirkpatrick as both a planning and an evaluation tool and should be flipped upside-down to re-organize the steps into a backwards planning tool. Still, the model is seen as offering flexibility to users as it permits them to align outcomes of training with other organizational tools (e.g., company reports and greater commitment of employees) (Abernathy, 1999). Though the model has been used for

decades in the evaluation of commercial training programs, some scholars have suggested its use for research studies of academic programs and have used it for the purpose (Tarouco & Hack, 2000; Boyle & Crosby, 1997), while others have suggested a combination of the model with other professional development tools (Grammatikopoulos, Papacharisis, Koustelios, Tsigilis, & Theodorakis, 2004). In particular, level four of Kirkpatrick's model is highly relevant to distance learning as it seeks tangible evidence that learning has occurred, as does level two (Galloway, 2005). This researcher has found the model to be relevant and useful in evaluating the impact of a distance education program. The implications and relevance thereof are discussed in this article.

Guba and Lincoln's (2001) fourth generation evaluation approach views stakeholders as being the primary individuals involved in determining the value of a given program (Alkin & Christie, 2004). In attempting to satisfy national stakeholders, this study was carried out based on the recommendations of the Higher Education Quality Committee (HEQC), the agency with the executive responsibility for quality promotion and quality assurance in higher education in South Africa (HEQC, 2009). This study investigated the views of graduates of the program and of their principals and immediate line managers in order to create multiple realities based on their perceptions (Alkin & Christie, 2004). The role of the researcher was to tease out these constructions and to discover any information that could be brought to bear in terms of evaluating the program (Guba & Lincoln, 1989).

Background to the Study

In South Africa, ongoing changes affect the educational landscape, and one of the major areas being focused on in the country is the need for the accountability of education providers. This is driven partly by the need to provide value for money (Council on Higher Education [CHE], 2005). Furthermore, internationally, the importance of improved accountability at all levels of public education is recognized (Fahy et al., 2007). Factors that call for increased accountability in higher education include disappointing completion rates and perceived inadequacies in the preparation of graduates for the demands of the global economy, among others (Shulock, 2006). One of the fundamental forms of institutional accountability is gathering and analyzing information about the careers of students after graduation (Fahy et al., 2007), which informs the need to emphasize quality improvement throughout all facets of an institution's academic provision (Pretorius, 2003).

Although the qualifications of the teaching force in the country have improved, most reports indicate that the majority of teachers have not yet been sufficiently equipped to meet the education needs of a growing democracy in the twenty-first century (Department of Education [DoE], 2006). Two of the most important factors in determining the quality of education are the academic level and the pedagogical skills of the teacher (Chung, 2005). The government's policy to provide "more teachers" and "better teachers" is underpinned by the belief that teachers are the essential drivers of good quality education (DoE, 2006), an assertion supported by various research studies (Robinson & Latchem, 2002). Thus in pursuing this goal, it becomes imperative for stakeholders to evaluate the effectiveness of programs.

One of the key principles in the Revised National Curriculum Statement (RNCS) of the South African Government focuses on the development of the knowledge, skills, and values of learners (DoE, 2005). This in turn naturally influences the goals of any program designed for educators of such learners. The Advanced Certificate in Education (ACE) is a professional qualification which enables educators to develop their competencies or to change their career path and adopt new educator roles (DoE, 2000). The admission requirement for the ACE is a professional qualification (CHE, 2006), which may be a three-year teacher's diploma, a bachelor's degree in education (BEd) or a post graduate certificate in education (PGCE) for those who want to specialize in the field of Education Management (University of Pretoria [UP], 2009). The specified overall learning outcomes of the ACE require a qualified practitioner at this level to be able to fulfill the role of the specialist education manager (DoE, 2001). Successful candidates need to be highly competent in terms of knowledge, skills, principles, methods, and procedures relevant to education management, be prepared for a leadership role in education management, understand the role of ongoing evaluation and action research in developing competence within their chosen aspect of education management, and be able to carry out basic evaluations and action research projects.

The Unit for Distance Education at the University of Pretoria offers three distance education programs, one of which is the ACE (Education Management) program, which was established in 2002. Based on the national specified overall learning outcomes, the university identified four key dimensions for this particular ACE, namely Education Management (two modules), Organisational Management (two modules), Education Law, and Social Contexts of Education and Professional Development. The ACE (Education Management) program was developed based on these six modules, which are presented in three blocks of two modules each. Students may enrol at any time and can complete the ACE program in a minimum of three six-monthly examination sessions or a maximum of eight examination sessions (UP, 2006).

The demographic profile of enrolled students reveals that the majority are geographically dispersed in deep rural areas of the country. Only 1% of them have access to the Internet, but 99% have access to mobile technology (Aluko, 2007). To meet the needs of this student population, paper-based distance learning materials are made available in the form of learning guides, tutorial letters, and an administration booklet. Face-to-face contact and tutorial sessions are organised at various centers around the country (UP, 2009). In order to meet the unique needs of these students, the university has embraced the opportunity to make use of mobile phone technology in the form of SMS text messaging for both administrative and academic purposes.

In terms of evaluation, student feedback (formative evaluation) on the program has often been relied upon to ascertain its strengths and weaknesses, which in turn has guided the improvement of its quality (UP, 2006). However, the HEQC, after reviewing the program in 2006, suggested the university determine its impact on graduates' professional activities. Thus, the research question posed was the following: What is the impact of the Advanced Certificate in Education (Education Management) program on the professional practice of graduates and what possible suggestions could be proffered for its improvement? One trusts that answers to this question may lead to the improvement of the program.

Research Design

Methodology

Survey instruments have been identified as being the most popular data collection tools in outcomes measurement and evaluation (Champagne, 2006; Newcomer & Allen, 2008). However, focusing on only one tool is problematic in terms of reaching an in-depth understanding of the phenomenon since it can lead to skewed findings (Lee & Pershing 2002). Researchers are advised to adopt multiple strategies (Reeves & Herdberg, 2003; Newcomer & Allen, 2008). For this study, the researcher combined surveys and focus group interviews. This combination of methods capitalizes on the strengths of both qualitative and quantitative approaches and compensates for the weaknesses of each approach (Punch, 2005). Table 1 shows the instruments used, the participants, and the areas of focus included for each instrument.

Table 1

Instruments Used in the Study

Graduates (Survey 1) (N = 200)	Principals (Survey 2) (N = 73)
1. Contextual information of graduate-participants	1. Contextual information of principal-participants
2. Overall program design	2. Specific program-related information
3. Program evaluation	3. Overall impact of the program
4. Overall impact of the program	
Focus group 1 (N = 6)	Focus group 2 (N = 6)
1. Motivation for enrolment	1. Overall impact of the program
2. Overall Impact of the program	2. Identified gaps in the training of graduates
3. Suggestions for program improvement	

Question items for the surveys were mostly open-ended, which put the responsibility for ownership of data much more firmly into the respondents' hands (Cohen, Manion, & Morrison, 2000). Some closed questions were included where necessary to elicit fixed responses from the respondents, for example the questions relating to contextual information. Thus, with the inclusion of focus group interviews, one could say the study was largely qualitative.

The survey instruments were first piloted on a sample of participants (20 graduates) from Gauteng Province where the university is located in order to enable quicker responses. The pilot survey was distributed by means of postal delivery. The two interview schedules were piloted with a graduate and a principal in the same locality as the university. The pilot process enabled the researcher to improve some questions, which appeared to be ambiguous.

After improving the instruments, both surveys were sent out by post with covering letters attached that explained the purpose of the study and requested the voluntary participation of the targeted groups. It was made clear that participants could withdraw from the study at any stage. Further, the implications of the non-confidential nature of the second survey were explained in the letter, for those graduates who might be willing to allow us to contact their principals/line managers. According to Konza (1998), it is important to consider the dignity of participants in any research study.

To ensure content validity of the instruments, the questions were based on the stated outcomes of the academic program (see Background to the Study) with a focus on the Kirkpatrick evaluation model. With reference to Kirkpatrick's model, the researcher developed a schematic diagram that shows the dependent relationships between the outcomes of a program, which should be determined by national needs (that institutions are expected to support), the aspirations of incoming students, and program evaluation. This relationship is depicted in the figure below.

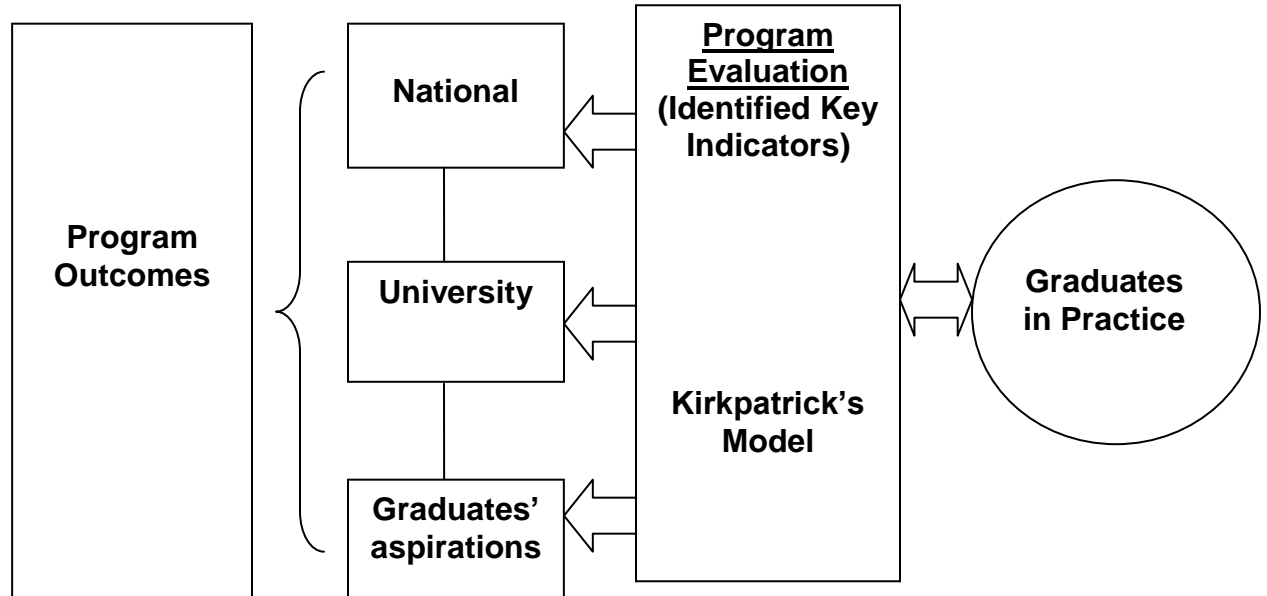


Figure 1. Understanding the relationship between program, program outcomes, and program evaluation.

The researcher developed the outcomes of the three identified stakeholders (national, university, and graduates) into key indicators on the impact of the study program. This content validity based on the outcomes is reflected in Table 2.

Table 2

Content Validity of Instruments (Based on the Outcomes of the Program)

National outcomes	University's outcomes	Identified key indicators
<p>To empower students to:</p> <ul style="list-style-type: none"> a. be highly competent in knowledge, skills, principles, methods, and procedures relevant to education management; b. be prepared for a leadership role in education management; and c. understand the role of ongoing evaluation and action research in developing competence within the chosen education management and be able to carry out basic evaluations and action research projects. 	<p>To empower students to:</p> <ul style="list-style-type: none"> a. critically evaluate, develop, and improve self-management and the ability to contribute to the transformation of the school b. develop professional managerial competence through formalising and encouraging critical reflection on both practical experiences and engagement with theory in order to manage contextual challenges... and to contribute to the development of appropriate school policies c. provide sufficient rigour for further studies 	<ul style="list-style-type: none"> a. Graduates' personal developments b. Graduates' classroom practice c. Graduates' ability to adapt and implement new policies d. Graduates' ability to play leadership roles e. Graduates' involvement in research and developmental projects f. Exposure of graduates to wider career opportunities and lifelong learning g. Effects of graduates' knowledge on their colleagues at work

Target Groups and Sampling

Research shows that reports of graduates' careers are often based on varying sample sizes (Fahy, Spencer, & Halinski, 2007). For this study, the first and second cohorts of students that graduated from the program – 2004 and 2005 – were targeted. There was a total of 1,970 graduates of which 1,455 graduated in 2004 and 515 in 2005. Their principals or line managers were also included in the target groups in order to gain a second opinion of the impact of the program, beyond that which was reported by the graduates. This group of graduates was chosen because the researcher felt they would have had some time to put into practice what they had learned. Multi-stage and purposive sampling techniques were used to identify prospective participants (Punch, 2005).

Three provinces out of the nine in the country were targeted. These were Gauteng, Mpumalanga, and Limpopo. These provinces were chosen for three reasons. First, their proximity to the university campus facilitated telephone contact and postal delivery (the project relied mainly on the postal delivery system, which may be unpredictable). Second, the majority of the students in the program tend to be drawn from two of the targeted provinces (Mpumalanga and Limpopo). Third, the choice of nearby provinces enabled the researcher to have adequate time for the planned focus group interviews as participants for the interviews were identified from the returned surveys.

Data Collection Strategies

Survey one.

The names and contact information of 1,000 (51%) of the 1970 graduates who had completed the program in 2004 and 2005 were drawn from the university's mainframe computer. These were all the graduates from the three provinces selected for the study. A short message service (SMS) was sent to them in order to inform them about the study and its aims. This was made possible because the university makes use of mobile technology and bulk SMS messaging as a means of support for students enrolled on the program. Later, surveys were sent through the post to the 1,000 graduates. Each package included a postage-paid return envelope. It was not possible to send the surveys electronically because, as indicated earlier, most students enrolled on the program were from rural areas and had little access to email or the Internet. A follow-up SMS was sent to participants in order to remind and encourage them to complete the surveys and return them on time. In addition, the graduates were asked to indicate their willingness to allow us to contact their principals and line managers by sending us their contact details. There was a return of 228 surveys from graduates. Of these, 20 were returned unopened (probably undelivered) and eight were received after the cut-off date (the date became important in view of the time constraints for the project). A total of 73 graduates gave us permission to contact their principals/line managers. Eventually, 200 surveys (a 20% response rate) from graduate-participants were analyzed for the study. In a similar study (Distance Education and Training Council, 2001), a return of 18% was regarded as being acceptable for mail surveys.

Survey two.

The second survey was sent to the principals/line managers identified by the 73 graduates, again through the post with self-addressed return envelopes. Only thirteen (18%) of the identified principals returned their surveys. They were asked to indicate the name of the graduate on behalf of whom they were completing the questionnaire. This to a large extent compromised the level of confidentiality, but it was unavoidable due to the purpose of the study.

Focus group interviews one and two.

Fourteen participants indicated their willingness to attend the two focus group interviews (seven participants per group), but two of them later declined. Thus, 12 interviewees (6 graduates and 6 principals) participated in the two respective focus group interviews in order to validate some of the trends that emerged from the surveys. Several phone calls were made to follow up with those who indicated their willingness to be interviewed. Since most interviewees were from geographically dispersed rural areas, the Unit for Distance Education covered their travel and subsistence costs.

The interviews with the respondents were each one to one-and-a-half hours in duration and were recorded. Two research assistants were employed to assist the interviewer. One assistant manned the electronic device used for recording the interview, while the other took notes in order to make sure that every important aspect was recorded.

Data Analysis

The *Atlas.ti 5.0* (Computer-Assisted Qualitative Data Analysis software) was used for the analysis of the interviews; relevant quotations and codes were identified based on the concepts and themes frequently mentioned by interviewees (Hardy & Bryman 2004). In addition, codes were developed for the open-ended questions after the questionnaires were returned by the respondents, while the few quantitative aspects of the questionnaires were analyzed by the Statistics Department of the University of Pretoria to arrive at the cumulative frequencies and cumulative percentages. The codes for both the surveys and questionnaires were in line with the key indicators shown in Table 2. The planning, implementation, analysis, and reporting of the project findings took place from September 1 to December 15, 2007.

Major Findings of the Study

The major findings of the study are reported below, based on feedback from both surveys and the two focus group interviews.

Survey One Contextual Data

Table 3 shows the response of the graduates to the contextual section of the questionnaire.

Table 3

Graduates' Background Information (N = 200)

Characteristics	Frequency	Percentage	Frequency missing
Gender			
Male	99	50	
Female	99	50	
Total	198	100	2
Length of service of graduates (in years)			
1-10	28	14	
11-20	127	65	
21-30	36	18	
31-40	5	3	
Total	196	100	4
Post level of graduates			
Teacher	154	78	
Head of department	29	15	
Deputy principal	4	2	
Principal	9	4	
No longer working in educational sector	2	1	
Total	198	100	2
Nature of graduate's place of work			
A rural institution or office	161	83	
An urban institution or office	20	10	
An informal settlement	8	4	
Other	6	3	
Total	195	100	5
Places where graduates are currently working			
Primary ¹ school	123	62	
Secondary ² school	73	37	
No longer working in educational sector	2	1	
Total	198	100	2

¹ Implies graduates who taught specific learning areas in the primary schools based on their areas of specialization

² Implies graduates who taught specific learning areas in the secondary schools based on their areas of specialization

The contextual data show that 200 graduates participated in the research project with a gender split of exactly 50%. The data deviate from the norm, which is that most distance education students are female (National Centre for Education Statistics, 2003). A possible reason for the deviation could be the composition of people who responded to the questionnaires because available data from the Unit for Distance Education consistently show that there are more female students enrolled for distance education programs than males (UP, 2007). Career data reveal that 28 (14%) of the respondents have been in the teaching service for 1 to 10 years; 127 (65%) for 11 to 20 years; 36 (18%) for 21 to 30 years and 5 (3%) for 31 to 40 years. The data may suggest that the majority of educators seek further knowledge within the bracket of 11 to 20 years in the service. In addition, the data support the claim that distance education students are already in professions and are economically active (Braumoh & Osiki, 2008; Labuschagne & Mashile, 2005).

Of the graduates who responded to the question on the nature of their place of work, the majority (161, 83%) are employed in a rural institution or office; 20 (10%) worked in an urban institution or office; 8 (4%) work in an informal settlement; and 6 (3%) indicated 'other.' This finding supports other data from the Unit for Distance Education on the catchment areas for the program, which are predominantly the rural areas (UP, 2006). Furthermore, this finding may buttress past research on the link between education and rural development, which leads to greater economic growth (Beaulieu & Gibbs, 2005).

In terms of occupation, the highest percentage of respondents (154, 78%) to the first survey are teachers, the majority of whom work in primary schools (123, 62%), while 73 (37%) work in secondary schools. Of all the respondents, there were 29 (15%) heads of departments, 4 (2%) deputy principals, and 9 (4%) principals, while 2 (1%) were no longer working in the education sector. These findings show that the majority of students enrolled for the ACE (Education Management) program is from the primary school sector.

Survey Two Contextual Data

Contextual information on the principals/line managers was requested in order to ascertain how long they have been working with the graduates and to determine their job position. Of the 13 principals/line managers who returned the survey, 6 (46%) were working in primary schools at the time of the investigation, 6 (46%) in secondary schools, while 1 (8%) was working in a non-education workplace. In terms of job position, 9 (69%) were principals, while the remaining 4 (31%) were a deputy principal, a head of department, a lead teacher, and a manager. At the time of the investigation, 3 principals/line managers (30%) had been working with the graduate/s for a total period of 1-4 years, 7 (60%) for 5-9 years, and 1 (10%) for 12 years.

Graduates' Motivation to Undertake Distance Learning

Adults are motivated by diverse reasons to undertake study by distance learning. In particular, the opportunity for continuous self-improvement can increase teacher motivation (Chung, 2005). One of the graduates who participated in the focus group interview gave the following reasons:

TE: I believe that learning is a life-long process. One, I studied for the certificate in order to obtain more skills and to develop myself. Also, one can motivate others to go further with their studies.

Other reasons given by various participants included these: financial benefits, the need to stay abreast of changes in the South African education system, the quest for knowledge in education law, the desire to improve leadership skills or to compete for leadership positions, and the desire for promotion. All of these reasons, including the need to combine family and career responsibilities, concur with findings of past research studies (Aluko, 2007; O' Lawrence, 2007).

Graduates' experience of the program tallied strongly with their expectations. Three graduates did not respond to the question on whether or not their expectations had been met. Of the 197 who did respond to this question, 179 (91%) responded positively while 18 (9%) indicated otherwise. Even though this research study is not necessarily a "reaction" or "happy sheet" (Kirkpatrick, 1996), findings in this section can be related to the first level of Kirkpatrick's model, reaction, which probes customer satisfaction. Clark (2009) is of the opinion that this level is the most frequently used form of evaluation because it is easier to measure, but it provides the least valuable data. It has been suggested that *satisfaction* is not necessarily related to effective learning and sometimes discomfort in the learning process is essential for deep learning to occur (Tamkin, Yarnall, & Kerrin, 2002). It is the researcher's opinion that there might be a need to probe further the 18 (9%) graduates whose expectations were not met by means of a longitudinal study of this phenomenon.

Value of the Program

Personal development of graduates.

On the topic of the personal development of graduates, one of the interviewees said this:

SJ :..the program has helped me as we are working with people, especially at the school I've got problem attitude to tolerate others, and also to work with them in a very good way. Now I listen to people, and I respect their views...

His new approach has led to better interpersonal relationships between him, learners, parents, and other staff members.

Comments by other graduates on personal development included the following: the ability of graduates to take in new ideas and make sense of them (one graduate said, "...the ACE changed my way of perceiving things..."); the ability to think through new ideas (one commented, "It has improved my thinking ability. I am able to analyze challenging ideas"); and the exposure of graduates to what the roles of every stakeholder at the school involve (according to the graduates, they now understand what percentage of work is expected of each stakeholder). Other positive comments included improvement in time management; expanded confidence, which has made it possible for graduates to publicly articulate newly formed ideas (e.g., at staff meetings) and to write about them; the ability to work with other colleagues as a team; and the ability to work under pressure.

Effects of program on graduates' classroom practice.

Concerning the effects of the program on graduates' classroom practice, many attested to improvement in their teaching methods, their time management skills, their classroom control, and their relationships with learners and parents. As one said, "My relationship with learners has improved."

These views were supported by the principals as shown by one of their comments about a graduate-participant:

JL:...in terms of classroom practice, what I've noticed is that... he can handle discipline very well... And secondly, the subject matter... He used to (organize) workshops (for) other educators in preparation of learning programs and work schedule.

This study did not examine the impact of the improvement of teachers' professional practice on learners' performance. Nevertheless, there is ample evidence in the literature (Darling-Hammond, 2000; Rice, 2003) to suggest that teachers' attributes and qualifications determine student achievement to a great extent.

Effects of program on graduates' ability to adapt and implement new policies.

Comments from both graduates and principals who participated in the study indicated that the program has had a tremendous effect on the former's ability to adapt and implement new policies. One graduate said, "I never thought I would accept the implementation of OBE³, but now I like and appreciate the implementation." Two other graduates offered these comments:

SJ: Yes... One has been exposed to several acts and policies in ACE, so that when the new ones come, you find that you have

³ Outcomes Based Education

got a very good background. ...it helps us to manage change and to adapt easily to anything that comes. I realize that if one has not received that kind of education, you will be negative and resist new things.

MV: I would like to comment on the seven roles of an educator... which everybody would agree with me that when you assess... with this IQMS⁴, you have those seven roles. Now the difference between us and other educators is that they cannot interpret... That is why IQMS is still a problem. Many teachers are resisting it because they do not understand the language and the terminologies associated with the IQMS. But with us, it's easy because we know the seven roles. If I have to assess my peers, I know exactly what to assess them on.

According to one principal, even though the national Department of Education is trying its best to disseminate information to teachers, many teachers without this ACE qualification tend to associate legislation with lawyers and courts, and thus they resist new policies. Another principal stressed that "The level of awareness is also very important... because you cannot interpret or implement if you are not aware." This supports the view that management training programs are important in terms of the roles expected of teachers (DoE, 2000; Martin, 2004).

Effects of program on graduates' ability to play leadership roles.

In response to the question on the ability of graduates to play leadership roles, the majority of the principals stressed that graduates in their schools are indeed playing a variety of leadership roles. This has led to graduates supporting the school management teams, the school governing bodies, and the principals in their schools. Other graduates have been promoted to head of department or vice principal as a result of the program. A major reason for these advances is the level of confidence displayed by graduates. Many graduates' colleagues are ready to take instruction from them because they look up to them as role models.

However, a very low number, four (2%) of the graduates who participated, have not been able to play this expanded leadership role because they have not managed to secure a promotion post or because of the rigidity of their principals. The latter finding supports the concern already identified by scholars about the need for evaluators of training programs to take into consideration the factors that can inhibit the transfer of learning in the workplace (Tamkin, Yarnall, & Kerrin, 2002).

⁴ Integrated Quality Management Systems (for school-based educators)

Graduates' involvement in research and developmental projects.

Most of the graduate-participants have been empowered to become involved in research or other developmental projects. Findings from the first survey indicated that of the 157 graduate-participants who responded to the question on whether they have been involved in research projects or not, only 18 (12%) have either not been involved in any research or could not do so because of the rigidity of their leaders. On the other hand, 139 (88%) have initiated and taken lead roles in researching and implementing various school and community projects in areas such as HIV/AIDS, safety, greenery, teenage pregnancy, needy children, counseling, drug-abuse awareness, alternatives to corporal punishment, and extracurricular activities. In addition, some have attracted funding to their schools, while some (as parents) were serving on the governing bodies of their children's schools at the time of this investigation.

Exposure of graduates to wider career opportunities and lifelong learning.

One of the effects of the study program is that graduates have been exposed to wider career opportunities. They commented, for example, "It has opened up to me a world of opportunities" and "It has built my confidence to apply for promotional posts." This finding tends to support the view that exposure of graduates to wider career opportunities could lead to promotion (Davidson-Shivers, 2004), though not in all cases (Delaney, 2002).

On completion of the study program, 16 graduates (8%) have completed a higher degree in education, 126 (64%) were currently studying for a higher degree in education, 9 (5%) were currently studying in a different discipline, while only 47 (24%) were not currently studying further. Two graduates did not respond to this question. On the other hand, all the graduates who participated in the first focus group interview have completed a higher degree, indicating that learners have the opportunity to pursue lifelong learning after graduation (Belanger & Jordan, 2004). Furthermore, research shows that educational needs are becoming continuous throughout one's working life as labor markets demand knowledge and skills that require regular updating (O'Lawrence, 2007).

Effects of graduates' knowledge on their colleagues at work.

Three-quarters (149, 75%) of the participants attested to the fact that they shared their new knowledge and skills with their colleagues to a large extent, while 50 (25%) did to some extent. This they did by calling colleagues' attention to the legal implications of some actions. For instance, colleagues had to be alerted to the legal implications of meting out corporal punishment to learners and to learners' rights. Other effects included conducting workshops in order to inform their colleagues of current school policies and assisting school management with implementing new ideas. In addition, many of their colleagues have been able to emulate graduates in terms of regular pupil class attendance and classroom management, which has led to some being tagged as

“Best Educator” by the community. Many of their colleagues have been motivated to further their studies.

Regarding the value of the study program for their practice, 116 (59%) graduates rated this as excellent; 50 (25%) as above average, 30 (15%) as satisfactory, and 4 (0.51%) as poor. On the whole, 129 (66%) felt that their schools or organizations benefited from the program to a large extent, 65 (33%) said to some extent only, and 2 (1%) said not at all, while 4 participants did not respond to the question.

All the principals attested to the fact that graduates have added value to the general quality of their schools. Some principals noticed that there were differences between educators who have completed the study program and those who have not attended such programs. Therefore one may conclude that the ACE program has to a large extent met the specified outcomes indicated earlier in the Research Design section. The value of the program, as indicated by both graduates and principal-participants, can be measured on levels two (learning), three (behavior) and four (results) of Kirkpatrick’s model. Learning is evident in the extent to which participants have changed their attitudes, improved their knowledge, and/or increased their skills as a result of attending the program. A change in behaviour is evident in terms of how they react to colleagues, principals, and parents, and the final results achieved by the participants who attended the program are evident in terms of promotion, leadership positions, and improved quality of classroom practice. Clark (2009) indicates that these higher levels, which are considerably more difficult to evaluate, provide more valuable data. Nevertheless, participants identified some areas of the study program that require improvement.

Graduates’ Identification of Areas that need Improvement and their Suggestions

In this study, the major areas identified by graduates as requiring improvement include the following: the need to review some modules that were either repetitive in nature or contained low-level information on some topics; the non-practical nature of some aspects of the program, which prevented students from gaining hands-on experience; the omission of information on how to handle discipline in schools and how to handle resistance to change by long-service educators and school principals; and the need for the university to improve its administration and student support systems.

Some of the suggestions proffered by participants in this study may seem impractical in view of the distance mode of the program (for example the inclusion of computer studies, especially when most students are from rural areas with little access to computers). Some of their suggestions are also beyond the scope of this study.

The following recommendations and suggestions were made at the time of this study: the need to introduce subjects taught in schools as areas of specialization; the involvement of school principals in student assessment in order to expose students to the practical aspects of the program; and the review of certain modules so as to update, simplify, or make the learning

material more user-friendly. Other suggestions included the introduction or review of research projects, which should take place in students' schools irrespective of the type of school (i.e., primary or secondary); improvement of the existing student support structure; introduction of a workable structure to allow distance education students to contact one another; and the establishment of the program as compulsory for all educators, especially those in management positions. This last suggestion emerged because the findings indicate that most principals who have not been exposed to this program find it difficult to accept changes suggested by educators who have completed the program, which has led in some cases to victimization of such graduates.

Regarding this last point, the government has since embarked on an ACE (Education Management and Leadership Development) program for practising and aspiring principals in order to provide them with a formal professional qualification and to provide an entry criterion to principalship (South African Qualifications Authority, 2008). It is hoped that principals will thus be enlightened as to the importance of the ACE (Education Management) program and, as a result, be able to work with their teachers to implement new ideas to bring improvement to their schools.

Limitations of this Study

This research study was not particularly a focus survey, which is the first level of Kirkpatrick's model. However, inferences on whether the graduate-participants were satisfied with the study program may be drawn from the research findings. Also, the study did not include the views of the learners taught by the graduate-participants. The findings of this study may not be generalizable because the research study did not involve all the graduates of the program due to time constraints. Another caveat is that one cannot be sure that the positive changes in graduates, as attested to by all the participants, were necessarily due to the course of study they undertook through the university. Other factors such as graduates' length of service and other in-service training programs could have contributed to their improved performance.

Recommendations

Since this research study is limited in its focus and scope, it is recommended that a longitudinal impact study should be conducted with regard to the revised academic program in order to make the findings more generalizable. The reason for this recommendation is that the sample may not be representative of the behavior changes in all the graduates (Kirkpatrick, 1996). Future studies should investigate the relationship between teachers' professional development and learners' performance and measure the influence of such teachers on their colleagues. Surveys and interviews should be complemented by observation of practice, involvement of students being taught by identified graduates, and perhaps some kind of before-and-after research design.

Searching the literature has revealed a paucity of research on the impact of distance education programs on graduates and their workplaces. Hence, it is clear that more studies of this nature are required. The implications of the findings of this study in terms of the research, theory, and

practice of distance education point to four important reasons for undertaking more research in the area of program evaluation.

First, such research would help practitioners of distance education programs to determine the extent of learning and the change in behavior as a result of academic programs, the general impact of study programs on those who have graduated, and the impact on the quality of their work when they become employed. Second, program organizers could identify and correct any lapses that may be inherent in their distance education program offerings. Third, future program evaluation research would help to enhance the quality of distance education programs, especially in the context of developing countries where most distance education programs still depend on first generation delivery modes. Quality enhancement would justify the huge expenditure on such programs incurred by distance students and other stakeholders. Fourth, findings from such research could be used to motivate funding from the government and other interested agencies.

The inclusion of focus group interviews (qualitative tools) in future research studies would address the concern that South Africa needs to avoid some of the mistakes that have been made internationally (Kilfoil, 2005). An example of ill-advised practice is encouraging universities to report simple, readily available quantitative measures at the expense of complex qualitative assessments (Morrison, Magennis, & Carey, 1995).

Conclusion

Findings from this study strongly suggest that alumni may be regarded as a source of well-informed quantitative and qualitative data, a claim which is supported by Fahy et al. (2007). This study has demonstrated that the program under investigation appears to have positively impacted the professional practice of the graduate-participants as there is a strong relationship between the completion of the program and the improvement of their professional practice performance. Furthermore, participants attested to the fact that differences exist between the professional practice of educators who have completed the program and those who have not. These differences include the understanding, interpretation, and implementation of policies and the ability to handle research and development projects. In addition, there is ample evidence that graduates have better career and education opportunities. Finally, graduates exert positive effects on their colleagues' professional practice and serve as role models for their colleagues to further their own studies. Also based on these findings, one could posit that the four levels identified by Kirkpatrick (1996) in his model (reaction, learning, behaviour, and results) are key elements to evaluate to what extent a program has met the intentions and expectations of key stakeholders.

Program evaluation is a useful way of assessing how public service programs are working in the greater public interest (Newcomer & Allen, 2008), and it is an important form of institutional accountability (Fahy, Spencer, & Halinski, 2007). Hence institutions have a duty to pay more attention to this practice. The researcher, in support of Kirkpatrick (1996), is of the view that evaluation mechanisms should be built into every academic program at the planning and implementation stages.

Nevertheless, it has been stressed that self-evaluation is rarely the best way to determine whether a person's behaviour (the third level in Kirkpatrick's model) has actually changed as a result of a training program (Ford & Weissbein, 1997). Research has shown that supervisors may have emotional links (either positive or negative) with participants, thus creating potential obstacles and bias (Galloway, 2005). This statement is supported by the fact that some of the graduate-participants in this study refused permission for the researcher to contact their principals (probably due to a poor relationship between them). There were also those who indicated that principals/line managers sometimes become stumbling blocks in the implementation of innovations learnt from courses they have undertaken, despite the fact that such innovations might improve the school.

Wisn, Nazma, and Pscherer (2001), who compared the quality of online and face-to-face instruction, suggest that the results of evaluation of distance education programs may be helpful in course design and the development of student support services. In support of the importance of program evaluation, it is of interest to note that the University of Pretoria has since reconceptualised and improved the design of the ACE (Education Management) program based on three levels of planning and development: programme design, course design, and materials development (Welch & Reed, 2005; UP, 2008; Fresen & Hendrikz, 2009). This involved developing extensive academic support structures to help students succeed in their studies, including an orientation program, more contact sessions, tutorial letters, tutorial sessions, assignments, SMS messages, and an academic enquiry service. The re-launched ACE (Education Management) study program was fully accredited by the Higher Education Quality Committee in March 2008 (Mays, 2008). Presently, as a proactive approach, the university has introduced a comprehensive research project to trace the holistic success of the upgraded program.

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Distance Learning and Teacher Education in Botswana: Opportunities and Challenges

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Abstract

This paper reports on a study at Molepolole College of Education (MCE) involving teachers and tutors in the Diploma in Primary Education (DPE) program by distance mode, an in-service program aimed at upgrading academic and professional qualifications of primary school teachers in Botswana. The study sought to understand the level of access and the challenges faced by teachers and tutors. Data was collected through in-depth interviews, survey, and document analysis. Findings showed that teachers should be enrolled in the program at a younger age, and issues that lead to delays in completion must be addressed. The paper recommends that the Ministry of Education (MOE) should hire full-time tutors to support teachers at their bases, provide resources for practical subjects, organize workshops to familiarize tutors with appropriate strategies for adult learners, increase the duration of residential sessions, explore the use of alternative instructional technologies, and institute regular customer evaluations.

Keywords: Distance education; basic education; teacher education; quality education; access to higher education; challenges of distance education

Diploma in Primary Education (DPE) in Botswana

Education plays an important role in economic and social development. Therefore, many governments, Botswana included, value basic education and equal educational opportunity. Basic education equips recipients with skills and knowledge that can enable them to deal with problems at a personal and a national level. In developing countries, governments have enthusiastically embraced distance learning as an affordable solution to address problems of equity and access to education. Distance education has been used to provide cost-effective teacher education, and it can be used to train large numbers of teachers within short periods of time. In Africa, countries that have provided successful and large-scale distance teacher education include Nigeria, Tanzania, South Africa, Zimbabwe, and Uganda (Siaciwena, 2006). However, distance learning

has not always lived up to its promise. One may question whether the massification of teacher education guarantees the quality of teacher education.

This paper discusses access to the Diploma in Primary Education (DPE) program by distance mode in Botswana and the challenges facing teachers and tutors in the program. It is both an attempt to unravel the state of affairs and to air the voices of the people involved in the program.

Background

The United Nations' (UN) emphasis on basic education as a human right and as a key to development has led many governments worldwide to endeavor to achieve this standard. Thus there has been a massive expansion of schools to cater for the growing number of children eligible for basic education especially in developing countries and subsequently of the demand for qualified teachers. Since independence in 1966, Botswana has maintained an expanding economy, which has led to a steady growth of the education system. As part of government policy to increase access to education, 10-year basic education is being implemented, which consists of seven years of primary and three years of junior secondary schooling. Currently, the Botswana government charges a small fee as part of cost sharing; however, parents who cannot afford the fee are exempted.

Educational developments in Botswana can be attributed to two policies based on the findings of the Presidential Commissions of 1976 and 1993. The first National Policy on Education also known as Education for *Kagisano* was adopted in 1977 and focused on increasing access to education. Hence educational development during this period was characterized by a massive expansion of schools. For instance, between 1979 and 1991 the number of primary schools increased from 500 to 700 whilst the number of secondary schools rose from 23 to 230.

The second policy, referred to as National Policy on Education (RNPE), was adopted in 1994 and called for more qualitative improvements of the education system. Consequently, one of the RNPE recommendations required all primary school teachers to have a minimum of a Diploma in Primary Education (DPE). The justification was that teachers with diplomas would add more value to the quality of educational provision in the country.

Teacher Education by Distance Learning in Botswana

The expansion of the education system and the need for quality in education created the demand for qualified teachers. Therefore, in 1999, the Government started DPE by distance mode to upgrade primary school teachers from the certificate to the diploma level to enable them to cope with curriculum and instructional reforms.

The first cohort enrolled in 1999 whilst the second joined in 2000. Out of 1,200 teachers in the two cohorts, 1,009 reached the final year and wrote examinations in 2003, while 191 dropped out between levels one and four. Moreover, out of the 1009, only 522 teachers passed their

examinations. Therefore, one of the major issues of concern since inception of the program has been the high attrition and low completion rates.

The Ministry of Education (MOE) nominates and sponsors eligible teachers for the program. The program is run in collaboration with the Centre for Continuing Education (CCE) of the University of Botswana (UB) and is expected to take four years or a maximum of six years. A two-week learner support residential session is organized during the school vacations in April, August, and December. Within this short time, teachers attend lessons from Monday to Sunday, consult their tutors, and write examinations. The pressure forces some of them to drop out, while others engage consultants to write assignments and projects for them. Furthermore, tutors have full-time jobs, which take precedence over their part-time job in DPE. This leads to limited time to assist learners, delays in grading and poor-quality marking, and sometimes loss of students' scripts or assignments.

Rationale and Research Questions

Different forms of evaluation are important for any educational program. Although there have been previous studies on distance education in Botswana (Tau & Thotsiesile, 2006), we believed that a fresh approach that investigates teachers' and tutors' opinions on the program was essential.

The study centered around three questions:

- How accessible is the DPE program by distance mode?
- What is the level of completion and attrition?
- What are the challenges facing teachers and tutors?

Statement of the Problem

There has been public concern over the time it takes for teachers to graduate. Records show a disturbing trend of low completion and high attrition rates. Although teachers enroll in large numbers, only a few complete the program after five or six years while the majority take longer than six years. This is unfortunate considering that more than 80% of the teachers enrolled are above 45 years and are nearing retirement age.

Significance of the Study

The findings of the study are important to policy makers in the Ministry of Education and the Department of Teacher Training and Development (TT&D). The findings will help them understand teachers and tutors' perceptions of the program and will inform some of their decisions about program efficiency. The findings will also guide personnel, such as tutors and coordinators, as they move forward. Further, the study will enrich the existing theory and knowledge base on distance learning in Botswana.

Literature Review

The Concept of Distance Education

Distance education has been conceptualized in numerous ways, but in simple terms distance education refers to a planned and regular educational provision where there is distance between the instructor and the learner. Generally most conceptions point to the following features: (a) absence of a teacher, (b) use of mixed media in teaching and learning, (c) correspondence, (d) independent learning, and (e) possibility of face-to-face meetings with tutors. In this paper the terms distance learning and distance education are used interchangeably.

Benefits of Distance Learning

Distance learning remains the only viable option for reaching dispersed groups of teachers in remote areas. Additionally, it is cost-effective and convenient for learners who cannot leave their work to study on full-time programs. As an in-service program, it does not deplete classrooms of teachers since they learn as they work. Chute et al. (1999) list other benefits of distance learning: (a) it allows the training of more people; (b) it can be delivered to home and work sites, which are convenient to students; and (c) it is learner-centered and affords students more control of the pace and the style of learning.

Challenges in Distance Learning

Whereas there is agreement on the benefits of distance learning, controversy persists with regard to certain fundamental issues. One of the major disputes revolves around the quality of such programs. According to Hope et al. (2006), some of the quality concerns in distance learning programs are (a) limited use of technology and more dependence on traditional methods of instruction, (b) lack of awareness of quality parameters of delivery systems among staff, (c) general inefficiency of administrative systems, and d) lack of standard criteria to measure the quality of services.

Another problem associated with distance learning is high attrition rates. Numerous studies have shown that the reasons for attrition are many and complex. Garland's ethnographic study identified some barriers to persistence in distance learning (cited in Simonson et al., 2000). Persistence here means the active enrolment status of students. Situational barriers included a poor learning environment and a lack of time; for example, students felt that the course took more time than anticipated because they had to juggle the demands of work, home, and school.

Berge and Huang (2004) categorized variables to persistence in distance learning as follows: a) personal variables, such as age, gender, ethnicity, income, previous academic experience, and motivation; b) institutional variables, such as institutional attitude and learner support; and c) circumstantial variables, such as the nature and quality of interaction between students and

institution, course design, and facilitation. Although the study focused on e-learners, the same variables come into play in traditional distance education programs.

Kember (1989) also identified variables linked to attrition, such as income, gender, and distance from the learning institution. Learners engaged in distance education are usually adults. Kember argues that this leads to challenges, such as the learners' ability to integrate the demands of off-campus study with family, work, and social commitments. Distance learners also experience feelings of isolation and stress due to lack of organizational support, which may eventually lead to non-completion. Kember's (1989) conceptual model of attrition in distance education showed the influence of such variables as family context, background, personal motivation, depth of commitment to completion, previous educational experience and achievement, and institutional support.

Similarly, Fjortoft's (1995) study investigated predictors of persistence in distance learning programs (cited in Simonson et al., 2000). Results showed a positive relationship between intrinsic motivation and continued enrolment. In other words, an internal desire for satisfaction and challenge in one's career motivated adults to continue in their education more than a desire for enhanced salary and career mobility. Intrinsically motivated learners and those with high expectations of completing the program have higher success rates. The findings further showed that older students were less likely to persist in distance learning programs than younger students. The high attrition rates amongst adult learners could be attributed to the multiple social roles they play, which leave them with limited time to study.

Another variable that has been attributed to attrition is cognitive overload. Tyler-Smith's (2006) study on early attrition among first time e-learners found that learners suffered from cognitive overload, which was a major contributing factor to high drop-out rates. According to Tyler-Smith, learning complex and or technically demanding material requires the building of mental models or cognitive schemas over time (2004, p. 7). Learning new material or a skill for which a schema in long-term memory is undeveloped or non-existent can cause working memory to quickly overload its limited capacity. Cognitive overload here means a "mental blackout" precipitated by learning new and varied content for which the mental models are non-existent; thus, adult learners feel frustrated as they are unable to comprehend the information, and they may not stay the course. We argue that adult distance learners in Botswana experience cognitive overload. This could be due to the long period of time spent out of school and the sudden, large, and varied amount of academic work they have to cope with, often with minimal organizational support and limited time to adjust. This coupled with their multiple roles as workers and their family roles may be a recipe for cognitive overload.

A 2005 study by Ukpo (cited in Kamau, 2007) in Nigeria showed that failure rates for teachers enrolled in the open and distance program was highly attributed to the following factors:

- failure of trainees to receive learning materials on time,
- student engagement in other economic activities to supplement their family incomes, and

- poor learner support services especially where study centers are under-resourced and overstretched.

Another study by Fast (1995) on instruction at different sites found that 60% of remote site students disliked the fact that there was a lack of opportunity to interact one-on-one with their instructors (cited in Simonson et al., 2000). Similarly, Kamau (2007) asserts,

Without an effective learner support services system that provides on-site face-to-face tutorials, timely feedback on student performance and access to library services, student achievement will inevitably be undermined and dropout rates and procrastination will increase, while the advantages of distance education including cost effectiveness, will be whittled away. (p. 6)

Research Method

Context of the Study

The study was conducted in Molepolole College of Education (MCE) in August 2008 during the two-week residential session. During school vacations, the premises are used for the provision of the DPE program. Furthermore, since this is a MOE initiative, the principal of the college, in collaboration with CCE, is in charge and oversees the recruitment of tutors, the examinations, and the graduation to ensure that academic requirements are met. In this regard, the program coordinator assists him. Program tutors are teachers in secondary schools and lecturers from colleges of education (mainly MCE) and the University of Botswana (UB).

Research Design

A mixed methodology design was used, comprising qualitative and quantitative research with the qualitative paradigm being dominant. Gay & Airasian (2000) argue that despite the differences between quantitative and qualitative research, the two paradigms should not be considered as oppositional but rather as complementary components of scientific and disciplined inquiry.

Sandelowski (2000) contends that, “mixed method research is a dynamic option for expanding scope and improving the analytic power of studies.” Therefore, a mixed methodology research strategy was employed because the researchers wanted to capture the different facets of the study, which would not have been possible if only one strategy were used.

Target Population

The target population consisted of program tutors and teachers enrolled in the program who attended the August 2008 residential session. The teacher and tutor population was made up of both men and women of varying ages. The teacher population comprised 350 students, of which 161 enrolled in 2002 and 189 in 2003. The total number of tutors was 60.

Sampling Procedures

Purposive sampling was employed to select teachers for in-depth interviews. A purposive sample is a *rich case* sample where a researcher chooses a few individuals whom he/she considers to be knowledgeable about the issue under study (Mertens, 1997, p. 261). Purposive sampling depends on the researcher to choose these individuals, raising the question, how does one choose some individuals and exclude others? Nevertheless, if used properly, purposive sampling can be a powerful tool in research to obtain an in-depth knowledge of the problem under study.

With the help of information collected from the records availed by the program coordinator, 10 teachers were selected for in-depth interviews. Out of these, two were male whilst the other eight were female. The number of women selected was higher because according to the registration records about 80% of the teachers enrolled were female. Three of the teachers enrolled in 2002 whilst the other seven enrolled in 2003. The 2003 cohort had a higher number of students attending the session compared to the 2002 cohort, thus it comprised a larger representation in the sample. The other criterion for selection was age. Registration records showed that more than 80% of teachers enrolled in the program were above 45 years. Therefore, out of the 10 teachers selected eight were above 50 years while the other two, one male and one female, were aged below 45 years.

For the survey, 24 tutors with equal gender representation were selected using non-probability sampling. Sandelowski (2000) posits that non-probability sampling is based on the researcher's judgment or convenience. A major advantage of non-probability sampling is that it is faster and less expensive. However, the disadvantage is that the findings may not be generalized to a larger sample with confidence. Most tutors who participated were selected on the basis that they were colleagues of the researcher at MCE. This made it easier and faster to administer and collect the questionnaires within the time constraints of the study. In this regard, the researchers cannot claim that the findings can be generalized to the larger sample with confidence because of the small sample size and the non-probability manner in which tutors were selected.

The teachers and tutors selected were those that the researchers considered knowledgeable of the issues under study. We considered the sample sizes for teachers and tutors appropriate because they were rich cases that could provide in-depth information on the research topic.

Data Collection

Open-ended interviews were used, which allowed probing and assessment of the interviewees' feelings. The individual interviews were tape-recorded, with each interview session lasting 30 to 45 minutes.

Also, a questionnaire was self-administered to the tutors. This was done to explain the purpose of the study and to win the tutors' trust. They were asked to complete and return the questionnaires within two weeks. The questionnaire was comprised of closed- and open-ended questions. The closed-ended questions contained yes and no checkboxes while the open-ended questions provided spaces to elaborate on responses. As well, document analysis was conducted to gather data on teacher enrollment, attrition, completion rates, and age. Key documents reviewed included admission and graduation records.

Triangulation was employed to provide exhaustive information on the topic under study. As Creswell (1994, p. 175) contends, triangulation is important because the methods in data collection complement each other in such a way that overlapping and different facets of the phenomena under study emerge. Our assumption was that weaknesses in each method would be compensated by the counter-balancing strengths of the others. Further, if the data collected using different methods showed the same pattern, the findings would be considered more credible.

Analysis of Research Findings

Generally, qualitative data was analyzed simultaneously with data collection. For instance, by the end of the fourth interview, researchers were experiencing a sense of data saturation with each subsequent informant narrating nearly similar responses. Of the 24 questionnaires issued, 20 were returned; therefore, the return rate was 83%.

After data collection, teachers' interviews were transcribed, coded, and organized into emerging themes. Data from documents was compared, integrated, and collated with other data sources in an attempt to add nuances that might reside in these records. Data was analyzed and presented according to research questions. The findings were presented in a descriptive form since the study was mainly qualitative in nature.

The research set out to explore and answer three research questions related to access to distance education for teachers, rates of completion and attrition, and challenges facing the teachers and tutors. The study findings are presented below thematically.

Access to the Program

Seven teachers had enrolled in the program in 2003 while the other three joined in 2002. When asked how they enrolled they explained that they applied and were nominated by the Ministry of Education (MOE). They were fully sponsored by the Botswana government. On the question of whether there were delays before admission, eight teachers were emphatic that they were enrolled

on time and that the program was open to primary teaching certificate (PTC) holders who wished to upgrade their skills. However, they reported that they joined as a last resort when they realized that they may never be enrolled in full-time programs.

Rates of Completion and Attrition

Document analysis revealed that 278 teachers enrolled in 2002, and out of these 245 managed to proceed to level 4 (final year). This shows an attrition rate of 12% for the 2002 cohort. Moreover, out of the 245 in level 4, only 117 graduated in 2008. This shows that only 48% of the 2002 cohort completed the program.

For the 2003 cohort, 243 teachers enrolled. Of these 207 progressed to level 4, revealing an attrition rate of 15%. Of the 207, 54 graduated in 2008; hence, only 26% of the 2003 cohort has graduated five years after enrolment.

While the above figures may appear modest for a DPE program, behind each statistic there is a loss felt by each individual teacher, who could not stay the course and eventually earn a promotion, increment, and better retirement package, the sponsor who incurred unnecessary expense, and the pupils who will not benefit from their teachers' upgraded skills.

Challenges Faced by Teachers

Teachers explained that they had experienced many challenges in the course of their study. The main problem cited was inadequate learner support. Eight teachers narrated stories about tutors who had failed them. One female teacher had this to say:

We were new in this program, we needed tutors' guidance, only to find that some tutors were from the University of Botswana, and sometimes the lesson would collide with the time they are supposed to be teaching at UB. Distance education really needed special tutors, not those combining their students with us. Even though we sacrificed to meet them at late hours, they didn't come. Some tutors also didn't come, especially most people scheduled for the weekend.

They felt that most tutors were not helpful, as revealed by this teacher's comment:

The tutor, who took us in year 3 and 4 was a problem. He just came and wanted to talk to us without focusing on what we were here for. Instead of teaching us he said, just read for yourselves, even though you don't understand, he said go and read. If he was doing like the first one, we would have no problem.

Furthermore they felt that there was a need to define the role of tutors in the program, as indicated by one female teacher: “is it to teach or do nothing?” They reported that tutors approached their duties differently. Some tutors explained modules to them and assisted them while others dismissed their appeals for assistance: “Some say they are just tutoring; we have to do things on our own.”

Moreover, teachers were particularly unhappy with the frequent changes in tutors, which left them confused and led them to fail in certain subjects, as one male teacher reported: “At first I was given a music lecturer who left me immediately and then I missed so many concepts in music, I joined the other class, which was ahead of me. That is how I suffered in music.”

Another one lamented,

When I was doing year two, I had a problem, the lecturer for Communication and Study Skills (CSS) had left and I had the same lecturer for year 2, 3, and 4, whom I could not understand, and this is why I am having serious problem with CSS.

Furthermore, teachers reported that the tutors’ teaching strategies were not appropriate for learners of their age and level of education:

I think some tutors are lazy. Most of the primary teachers completed only Junior Secondary Certificate. Now here they are just teaching us as if they are teaching people who have completed form five. When you complain, they just tell you that the module is there. You have to read the module, I am just here only to guide you, but things are difficult because we are not educated, so we don’t understand.

Another one explained,

Those from university, I don’t know what is wrong, those from secondary school, they bear with us; they know that we are old; they just listen to us and understand us. The ones from UB, they just take us as if we are like their students, as if we have done form five, we have only done Junior Secondary Certificate level and we are old so our teaching is not that of their student level.

Another drawback cited was short residential sessions and inadequate study time as students juggled family, job commitments, and studies. One female teacher explained the problem this way:

We had a lot of work, you don’t have time to read, when you are from work, you are tired, you have to do the housework and then

after that you are tired, there is no time to read, when you come here the time is very short we just read at the same time writing exams, the time was just too short for us to study, that is why we fail exams.

Teachers also explained that learning materials were inadequate and usually sent late:

We would come here and then find that the modules are not there and then we would spend time doing nothing and then go back without doing anything. And then the assignment booklet, we would be promised that the assignment booklet, they would be send to our respective schools only to find that we have come back for another session without having those assignment booklets.

Other problems mentioned included the following:

- a lack of resources for practical subjects, such as art, music, and computers (pre-service students had access to learning resources, such as computers and art materials, while in-service students had only limited access), and
- a lack of libraries in remote areas, which made it difficult to conduct research for projects.

Challenges Faced by Tutors

Ten tutors reported that they experienced problems with students who failed to meet submission deadlines for their assignments and projects. Seven concurred with teachers that there was too much to cover within a short time. Five tutors who taught practical subjects took issue with the lack of resources for practical subjects like art, music, and computers. Four tutors reported that they found it difficult to teach DPE students, who had difficulties in communicating and understanding the medium of instruction, English. Other problems cited were plagiarism and absenteeism by teachers and late payment for services rendered. Some tutors expressed frustration over the long period taken to pay them for services rendered or to reimburse them for expenses incurred, which could take as long as six months. As such they were demoralized as they turned up for the next residential session before they had been paid for the preceding one, which may explain the lack of commitment tutors displayed towards their duties.

Discussion and Implications of the Findings

Access to the Program

Findings from teachers' interviews indicate that the program is accessible to those willing to upgrade their teaching certificate to a diploma level. However, teachers prefer full-time programs

and only enrolled in the DPE program as a last resort because government does not sponsor many teachers on a full-time basis. The implication is that stakeholders should make the program more efficient and effective so as to attract and retain teachers in order to empower them to cope with educational changes.

Completion and Attrition

Records revealed that although the program is supposed to take four years, on average it takes six years or more. Such a trend is likely to demoralize enrolled teachers and dissuade those who might be interested in joining in future. Furthermore, more than 80% of those enrolled in the program are above 45 years, and they may retire in fewer than five years after graduating. Therefore, although such teachers may achieve personal growth and a better retirement package, their new skills and knowledge will be of little benefit to their pupils and to the education system. However, it is important to note the lengthy period of time taken by the Ministry of Education and the University of Botswana to clear students for graduation after they have completed their studies.

Records further revealed that attrition rates are rising and may worsen. Some of the elderly interviewees in their final year seemed so discouraged that they may quit. Furthermore, as mentioned earlier, studies have shown that elderly learners are less likely to persist in distance learning compared to younger learners (Simonson, 2000).

Gender Implications

The findings have gender implications since a large proportion (80%) of those enrolled in the program are female. Teachers explained that with the large number of diploma, degree, and even master's degree holders in primary schools, it was now impossible for a PTC holder to be promoted. Failure to attain the DPE means that chances for career advancement are minimal. Consequently, the probability of economic advancement and quality-of-life for their families will be curtailed. This should be an issue of concern to the government since the teachers have children and/or grandchildren who are depending on them. Moreover, the small retirement packages can impact negatively on the health and general well-being of the female teachers in old age.

Challenges

Interviews with the teachers revealed that their greatest challenge was the minimal learner support from tutors. They preferred more face-to-face interaction with tutors, which is similar to Fast's (1995) findings. However, this was impossible mainly because of the limited time during the residential session and partly because of the attitudes of some tutors. There is a need to increase tutor-tutee contact hours since, as the teachers explained, their level of education makes it difficult to understand the modules and they need more support from tutors. Alternatively, the MOE should employ full-time tutors who can devote time to assisting adult learners. The late

delivery of learning materials was cited by learners as a major drawback, which is similar to Ukpo's (2005) findings in Nigeria.

Furthermore, the school-like mode of delivery that tutors use is not appropriate for this population of learners and neither is the pedagogy that borrows heavily from traditional classroom practices. This is not surprising considering that tutors are trained for conventional instruction at primary, secondary, or tertiary educational settings. Teachers were also concerned about the high turnover rate of tutors, which did not augur well for their learning. Analysis of tutors' demographic data revealed that 10 out of 20 tutors aged 30-40 years had been tutoring for fewer than three years, which could be an indication of a high turnover rate, something that teachers considered a major setback. There is a need to retain tutors and to ensure continuity.

On the other hand, tutors were frustrated by teachers' difficulties in understanding the modules and in communicating in English, the language of instruction. This could be attributed to the long periods of time that teachers have been out of school and the fact that lower primary teachers use Setswana as the medium of instruction and have little practice in English.

Minimal education levels could contribute to adult learners' frustration and lack of persistence. Berge and Huang's (2004) study identified learners' previous academic experience as a major determinant of perseverance. From the interviews, it was clear that adult learners felt overwhelmed by the amount of work they had to cover. Also, they complained that the content and methods of delivery were not appropriate given their levels of education. As one interviewee explained, some had only primary and junior secondary school education and they found it difficult to understand the modules written in English. With minimal organizational support this could lead to what Tyler-Smith refers to as cognitive overload. Tyler-Smith argues that encouraging and cajoling discouraged and wavering learners could help them to stay the course. However, this was not done as learners complained of receiving minimal support from tutors.

The situation is made worse by the short period of time within which they are expected to study the modules, attend lessons, and write examinations. Salmon (cited in Tyler-Smith, 2004) argues that it is important to reduce the amount of content-specific information in the courses especially during the early stages of the program to allow adult learners to gradually adjust to the cognitive load. It is unrealistic to expect adult learners to undergo a two-week crash program, in which they attend lessons seven days a week, consult tutors, and write examinations. We therefore argue that there is a need to either reduce the content taught and tested or to increase the learning time.

Another area of concern is a lack of learning resources for practical subjects. Teachers and tutors concurred that it was inadequate to teach/learn such subjects in a theoretical manner. This has implications for pupils because teachers may consequently approach their teaching from a theoretical standpoint.

Conclusion and Recommendations

The Diploma in Primary Education program offered by distance mode holds enormous potential for upgrading certificate holders to the diploma level. For instance, since 1999, more than 3,000 primary school teachers have gone through the program. This is a large workforce that can have a great impact on basic education in Botswana. However, if their training is compromised, it can have serious repercussions on the quality of basic education. Although teachers appreciate the opportunity accorded to them and the skill and knowledge they have acquired in the program, they are concerned about the challenges they face and the length of time it takes to graduate. The challenges, which include limited learner support from tutors, frequent turnover of tutors, inadequate learning materials, late delivery of modules, and others are real and need to be addressed. The aforementioned challenges make it imperative for the government to radically improve the implementation of the program so it is responsive to the needs of teachers and tutors. Failure to respond appropriately to these issues may compromise the quality of primary school teachers and consequently the quality of basic education in the country.

The study has not listed all of the challenges facing the distance DPE program; rather, it has tried to describe the state of affairs in the program to stimulate further research, discussion, and action.

In the light of the above findings, the following measures are suggested to improve the program:

- The Ministry of Education should hire full-time tutors to visit and assist teachers at their bases.
- Seminars and workshops should be organized to familiarize tutors with appropriate strategies for assisting adult learners.
- The duration of residential sessions as well as the number of contact hours between tutors and teachers should be increased to accommodate learners' needs.
- The Ministry of Education should provide resources for practical subjects, such as art, music, and computer education, so teachers can gain practical experience.
- Alternative modes of instructional delivery should be explored, such as Internet, telecommunication, videoconferencing, web conferencing, CD-ROM, audiocassette, and e-mail, instead of relying entirely on print media for course materials.
- Customer evaluation of the program should be conducted on a regular basis.

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Exploring Blended Learning for Science Teacher Professional Development in an African Context

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Abstract

This paper explores a case of teacher professional development in Botswana, where a blended learning solution was attempted. The analysis of the implementation environment reveals deficiencies in policy, schools (workplaces), and training providers. The paper concludes with three recommendations: 1) Schools should support on-going teacher learning in the workplace and should manage ICT resources for use by both teachers and students; 2) Government should support participatory and localised learning and institutionalise ICT access and use; and 3) Training providers should use blended methods and should model good ICT practices. The author also notes that change is needed in the culture of teaching and learning so that ongoing, situated, participatory, and collaborative approaches are accepted. Finally, collaboration between the training providers and the schools is necessary as is a change in beliefs about the use of ICTs in education.

Keywords: Blended learning; workplace-based learning; ICTs; Africa, teacher professional development

Towards Blended Learning Solutions for Africa

The rapid advances in information and communications technologies (ICTs) have acted as a catalyst for educational transformation in recent years the world over (Nichol & Watson, 2003). Africa is also attempting to take advantage of this technological revolution in order to make strides in the advancement of education (Selinger, 2002; Isaacs et al., 2004; Shrestha, 2000). For the continent, particularly sub-Saharan Africa (SSA), these technologies offer tremendous hope towards meeting the present day educational challenges of lack of access to quality higher education. Traditionally, open and distance learning (ODL) methods, particularly print and radio/audio, have been used to expand this access. In particular, teacher education, both pre-service and in-service, has benefited from this arrangement. However, these traditional methods of ODL, while having their merits, are not adequate to meet the high demand for quality teacher education as they lack the attributes of quality that tend to characterize the more modern technologies. Therefore there is growing consensus that SSA needs to explore the potential of

technology-mediated education if it is to survive on the global competitive stage (Selinger, 2002; Unwin, 2005; Mackintosh, 2005). An examination of the literature on ICTs for education reveals that one trend for improving quality in education, particularly continuing and distance education, involves blended learning (Lewin, 2000; Unwin, 2005). Blended learning refers to designing and delivering the right content in the right format using the right mix of media (Debande & Ottersten, 2004).

Blended Learning in Africa

The limited ICT infrastructure in Africa means that it is not feasible to run full-scale online programmes even if it is the best thing to do pedagogically. The ICT infrastructure problem, which is widespread across the continent, is characterized by limited availability and low-quality services. Isaacs et al. (2004) identify low Internet bandwidths, very limited telephone connections, and negligible computer ownership as serious and common problems across Africa. Most of the ICT infrastructure is limited to capital cities and major centres and is unavailable to the great majority of rural and remote area dwellers, leading to uneven access (Sagna, 2005). Therefore blended learning approaches have been recommended as the most efficient way to tap into the power of ICTs (Unwin, 2005). In combination with traditional methods of education delivery, it is possible that viable blended learning programmes could be developed and executed quite efficiently. In this regard, a number of initiatives or at least discussions in SSA are evident in the literature (for example, Patterson, 2005; Kruger & Spamer, 2006; Seleka et al., 2006; Leary & Berge, 2007; Schachter, 2005, Kok & Merz, 2004). However, only a few of the initiatives (such as Ayoo & Lubega, 2008) offer any comprehensive analysis of the instructional design process. There is a need for more explicit accounts of designing, developing, and implementing blended learning solutions in the context of Africa. The literature on blended learning is becoming awash with good exemplars in this regard.

Blended Learning Pedagogy

Several researchers, such as Boyle (2005), have sought to explicate theoretical models that will aid the development of pedagogically robust blended learning solutions. This paper will analyse two such articles in a bid to demonstrate how the design of blended learning environments could be made less tacit. These two models or frameworks take into consideration the complexity of blended learning environments especially in terms of the decision-making that informs their design and the factors that impact their implementation and how these should be viewed as intertwined.

The first model is suggested by Kerrs and De Witt (2003). They offer a general conceptual framework that guides the elements to be included, their relative weight, and their sequence in the blend. They use what they term the 3-C model, which conceptualizes learning as having three components, namely content, communication, and construction (which plays a facilitative and guiding role in the learning process). While they point out that not all the components need to be present for learning to take place, they argue that their collective presence leads to richer and more meaningful experiences. Each of these components can be delivered in different media

formats. The learning goals and specific objectives can help determine their relative weight (in terms of time to be spent by learners). For example, content would dominate if the knowledge to be learned consists of facts or rules to be recalled. In terms of the medium of delivery, they recommend that it should match the learning task. However, according to this model, it is not just the learning task match that should determine the delivery system but also the cost. Cost in this case is twofold: It should be considered from the institution's point of view, mostly in monetary terms, and also from the learner's perspective, which in this case is defined in terms of not just money but also time demands and cognitive effort. For instance, while face-to-face delivery, in the context of ODL, may be a pedagogically viable option to deliver certain learning activities, it may become costly for learners in respect of time and money required to travel.

Thus, in brief, the parameters of Kerrs and DeWitt's model suggest that blended learning solutions should take into account the following: learning goals and objectives, characteristics of the content, target group, and situation/institutional demands. Essentially, a blended learning environment needs to "...address the demands of a given learning situation" (p. 111).

The second model is presented by Alonso et al. (2005). Realising a gap exists as far as the insufficiency of teaching principles for e-learning, Alonso and others argue that there is a need for pedagogical guidelines for instructional practice. They say these guidelines should target analysis, design, development, support, and management of e-learning materials pedagogically. Their model takes into account the three basic learning theories of behaviourism, cognitive theory, and constructivism. Their view on these theoretical perspectives on learning is that they are interdependent and have a capacity to be combined to "...build instructional design heuristics" (p. 219).

This instructional design model is based upon the following premise:

...training should enable learners to apply the concepts learned at their workplace and evaluate the results... [and that] the aim is for learners to be engaged by the E-learning contents to the extent that they get to understand things that they did not comprehend before. This will make them ready to practice and take action to perform new activities (p. 222).

Subsequently, this will lead them to make reflections and to extend their knowledge to newer understandings and better practices.

To achieve this, the model makes use of the systematic development of instruction, which is composed of seven stages: analysis, design, development, implementation, execution, and evaluation. Underlying this process is an emphasis on the following:

- content structure, which is determined by the different information types and performance goals;

- cognitive processes, with a focus on factors that can enhance cognitive activity such as using visual formats to improve perception, using other media to reduce cognitive overload, or using concept maps to enhance coding; and
- collaborative activities, which are characterized by the co-participation in activities, the promotion of community spirit, and the facilitative role of the instructor.

The components identified in the blended learning menu are face-to-face teaching, online interactions, and self-paced online learning, which in the context of training facilitate direct training, coaching, and self help respectively. Similar to the Kerrs and DeWitt model, the nature of the blend is determined by learning objectives, the target learners, the content structure, and the available technologies. This model also places emphasis on the key role of managing the blended learning process.

These models exhibit similarities and complementary differences. Therefore taken together they form a robust theoretical basis for blended learning solutions with the major emphasis being on systematic development of instruction, which recognizes types of content and desired learning outcomes and matches them with appropriate strategies to ensure that learners learn and apply the acquired skills in a reflective way. The selection of an appropriate blend is determined by a number of parameters, such as objectives, types of content, availability of technology, and the demands of each delivery system on both the institution and the learner.

It is against this background that this paper will explore blended learning solutions in the context of Africa. The paper seeks to extend understanding of blended learning through the explication of some of the processes discussed above using a case study. The specific details of this paper are discussed next.

Aim and Rationale of the Paper

The specific aim of this paper is to give an account of a case study that used a blended learning approach in the context of science teacher professional development¹. It explains the instructional design process, and it analyses factors surrounding the implementation of the innovative part of the blended learning menu. The paper will demonstrate the complexity of ICT interventions in traditional methods and perhaps give a better theoretical and practical insight into how blended learning solutions play out in authentic African environments.

As far as the rationale is concerned, there was little, if any, evidence of research specifically targeted at determining the potential of the available ICT capacity in Botswana, particularly in secondary schools, in facilitating teacher workplace-based learning. Thus, the author investigated whether teachers can benefit from the available infrastructure for their ongoing professional development and the issues surrounding such. This rationale will become clearer in the discussion of the context below and in subsequent sections of this paper.

¹ The case study formed part of the author's PhD research (Boitshwarelo, 2007).

Context of the Paper

The specific context of this paper is an in-service training (INSET) programme at the University of Botswana, which offers professional development of secondary school science teachers in Botswana. To situate this specific context, a broad background, which touches on the aspects that are relevant to this study, is described briefly below.

Botswana

Botswana is a landlocked country situated in Southern Africa with a population estimated at about 1.8 million people, covering over 580,000 square kilometers of land. Relative to a majority of SSA countries, Botswana has impressive economic credentials and political stability. These offer a unique environment in which the potential for the use of ICT for development in general, particularly educational development, can be explored and tapped (Boitshwarelo, 2007).

Educational Developments in Botswana

With regard to access to basic education, Botswana has achieved the “10 year Basic education for all” for the current generation of young people with the latest statistics indicating that about 100% of all school-age children are enrolled in schools (Republic of Botswana, 2005). While access is almost 100% at the basic education level, with admission to senior secondary schools expected to rise to the same percentage in the next several years, the same cannot be said about tertiary education. This is because tertiary education is not able to adequately absorb the increasing output from secondary schools. Conventional modes of tertiary education, in particular, are not coping with the demands of education and training for manpower development in Botswana (Mokaeya, 2005). This problem is twofold. First, only a limited number of places for diploma and bachelor’s degrees exist for students who have successfully completed their secondary education. Second, those who are in the workplace and want to further their education, from diplomas to bachelor’s degree levels or from bachelor’s degrees to postgraduate level qualifications, including professional development programmes, have to compete with their peers for access to the limited places.

ICT Developments in Education

The government of Botswana is fully committed to the widespread adoption of ICTs in all sectors of society, including education. While the uptake of ICTs and the e-readiness of the education sector has been very low (Ministry of Communications, Science and Technology, 2005), the recently approved National ICT Policy, *Maitlamo*, promises to alleviate this problem as it aims to transform Botswana into an ICT-driven economy. The policy with regards to education makes a number of recommendations for programmes and projects that will be carried out in order to successfully implement ICT across all levels of education in Botswana. If these noble initiatives become a reality then the use of ICT to increase access to and quality of education at all levels of education could be realised. These recommendations build upon the Revised National Policy on

Education (RNPE) of 1994 (Republic of Botswana, 1994), which recommends ICT literacy for all secondary school children.

The University of Botswana

The University of Botswana, a national institution funded by government, is committed to the use of ICTs for innovative teaching and to the opening up of opportunities for non-conventional learners. Over the past several years, the University has developed its technological infrastructure including the acquisition of a learning management system, WebCT, to advance one of its aspirations to develop a student-centred, intellectually stimulating, and technologically advanced teaching, learning, and research environment (University of Botswana, 2004). This commitment is carried out by the Centre for Academic Development (CAD) through the Educational Technology Unit (ETU), which is charged with promoting “appropriate and innovative uses of educational technology.” One of the key performance areas (KPA) of CAD is as follows: “Extend access to higher education through the utilization of Information and Communications Technologies within the framework of lifelong learning and open learning.” This KPA augments another mandate of “extending the university’s programmes to non-conventional learners,” which is carried out by the Centre for Continuing Education. While the infrastructure is obviously not adequate, considerable progress has been made with a substantial number of courses (not programmes) having an online presence.

It is against this background of the growing presence of ICT infrastructure and the commitment to educational innovation in the context of open and lifelong learning that this study was carried out.

The INSET Programme for Science Teachers at UB

The INSET programme, which was the target of the case study, is offered by a department at the UB, whose mission is to provide instruction and research in order to produce high calibre computer studies, mathematics, and science teachers and thus contribute to national manpower development. This department also aims to provide opportunities for the professional development of serving teachers through improving and sustaining the efforts of its INSET section.

With regard to the latter function of professional development, the department usually runs its national INSET workshops every April/May school vacation for about two or three days for senior secondary science teachers on behalf of the Ministry of Education’s (MoE) Department of Teacher Training and Development (DTT&D), In-service Training Unit (University of Botswana, 1997). This training is aimed at the ongoing professional development of in-service teachers and is meant to continually improve the quality of science teaching. These workshops are run separately for biology, chemistry, physics, mathematics, and computer studies. The workshops aim to broaden the teachers’ pedagogical content knowledge (PCK) and increase their skills in learner-centred science education (Thijs, 1999). This approach is premised on the idea that initial teacher training is usually insufficient to ensure that teachers carry out their roles effectively as they have inadequate skills to integrate subject matter, pedagogy, and teaching context (Gess-

Newsome, 1999) and as such they need to develop PCK over the course of their careers (Shulman, 1986). During the workshops, participants gain theoretical knowledge and also, more importantly, they engage in hands-on activities, such as developing lesson plans and conducting microteaching sessions with peers. They also discuss their plans to implement the workshop outcomes in their classrooms once they are back at their schools. The teachers are expected to implement the skills they have acquired and discuss them with their peers. The trainers sometimes pay visits to the schools after completion of the workshops to offer support and to monitor the progress of the teachers.

A developmental study that targeted this INSET programme was carried out by the author to find out how the existing ICT capacity at the UB and in the country could be blended with the traditional method in order to improve it. This study was exploratory in nature and it used a developmental qualitative approach in the form of design-based research (DBR) methodology (Brown, 1992; Collins et al., 2004; Bell, 2004). DBR is carried out through extended, iterative theory-based interventions that explore learning in authentic contexts. These interventions, usually in the form of technological artefacts, are tested in particular situations, thus unpacking the issues surrounding their use (Design-Based Research Collective, 2003). The details of the study follow in the next section.

Blended Learning in Action: A Case Study Analysis

Analysis

The first stage of the study was to investigate the INSET programme described above, particularly its shortcomings and whether they could be addressed through online means. The main shortcoming identified in the INSET programme was the fact that while the teachers who were trained in the workshops value the knowledge and skills imparted to them, they receive no support when they apply these workshop outcomes in their schools. Since these workshops are used to teach innovative methods, teachers need a substantial amount of both expert and peer coaching before they can confidently and effectively apply the acquired skills. As mentioned by Alonso et al. (2003) "...training should enable learners to apply the concepts learned at their workplace and evaluate the results..." which in this case was lacking. From interviews with the concerned trainers and from previous research (particularly Thijs, 1999) the following reasons for this gap were identified:

1. There is a lack of enthusiasm once teachers return to their respective schools.
2. Peer coaching and collaboration within the school setting is very limited due to time and other constraints. Thijs also observed that in Botswana collaboration in the form of classroom observation and discussion does not fit with teachers' preferences or the school context. Additionally because only one or two teachers per school attend the workshop, it is difficult for the remainder to assume ownership of the innovation.
3. There is a geographical separation between workshop participants once they are back in their respective schools, and therefore there is very little continued interaction, if any.

4. Because of time and cost constraints there is little or no follow-up by the INSET staff at the UB.

Given these challenges, an online learning environment that facilitates continued interaction between teachers who have attended the same workshop and their trainers was conceptualized to facilitate distributed and situated learning and to form a community. This online interaction would be blended with the face-to-face workshop training and the printed material handouts. The online environment was envisaged with the understanding that although most teachers (as was the case with those at the workshop) do not have Internet access in their homes, they have some workplace access, with a few exceptions. It was acknowledged that this access is very limited but perhaps enough to be put to use for this purpose. As stated previously the idea was to investigate to what extent the available ICT-capacity in these schools could be used to support an online community of a select number of biology teachers.

Design

The goal was to design the online environment as an intervention in the existing INSET programme. The environment was called Biology Teachers Online (BTO) as it was targeting biology teachers specifically². The desired outcomes of BTO are outlined below:

- individual participation by teachers in the form of receiving and reading messages;
- information exchange between participants;
- social, professional, and academic interaction amongst teachers;
- expert advice from trainers at UB-INSET; and
- completion of collaborative tasks.

Towards this end a comprehensive design statement was developed, which included details on the following: conceptual background of BTO and its aim, technical and administrative information, design, structure, and media elements used, instructional approach and tasks, implementation, and evaluation. Essentially, BTO was designed to run in WebCT and to act as a space for collaboration, supported by other features that were meant to assist in scaffolding the social experience.

Development

BTO was developed according to the design details described above in WebCT at UB. The learning environment was developed in close collaboration with ETU (alluded to earlier). ETU assists academic staff in the production and use of a growing variety of educational technologies to improve their teaching and to engage students in more active learning. It manages and facilitates the use of WebCT, which is its primary delivery system. For this reason the staff at

² The programme for the different subjects (biology, chemistry, physics and mathematics) usually runs concurrently once a year in different venues. The researcher/author chose biology teachers because he shares a similar background and could easily relate to the issues of biology teaching.

ETU played a significant role in the iterative development of BTO: creating the course shell, advising on the use of WebCT tools, and creating accounts in the course for participants. The INSET staff members were asked to conduct a review of the learning environment, especially in terms of its pedagogical elements and its content before it could be implemented. Although there was not much feedback, the environment was approved. The figure below shows part of the BTO homepage after completion.

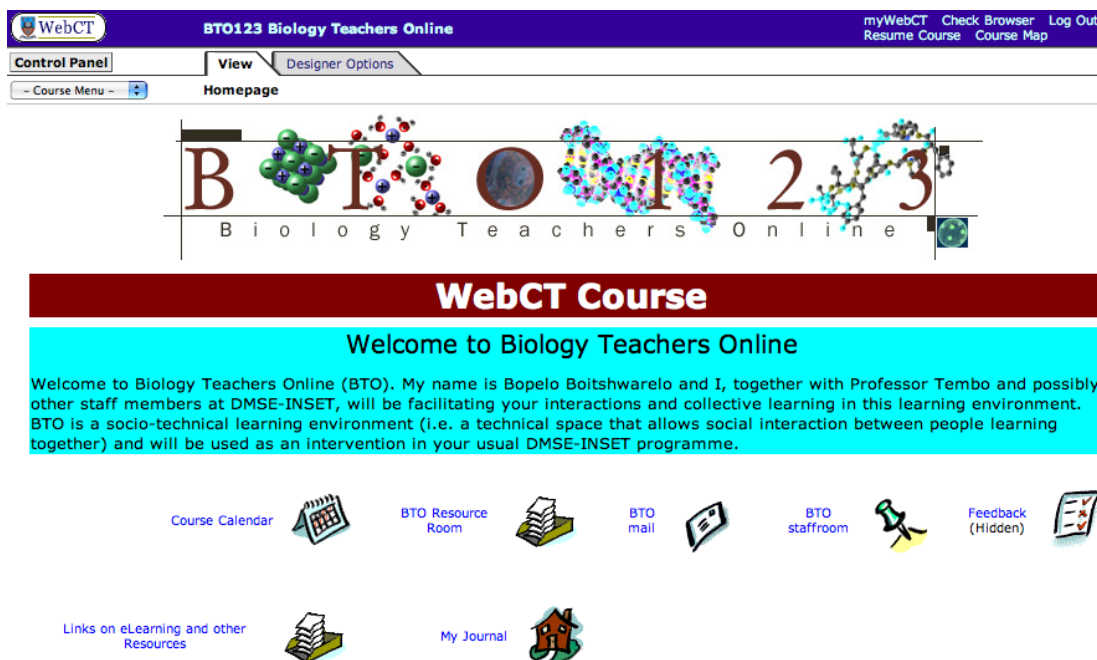


Figure 1. Part of the BTO homepage.

Implementation

BTO was implemented in 2006 for a period of about three months between May and August. This implementation followed an INSET workshop whose theme was the development and implementation of process skill in biology teaching. Only 18 of the expected 27³ schools were represented, each by one teacher, and three resource persons facilitated the workshop. The following activities for teachers were included in the workshop:

- carrying out exemplar biology practical work sessions and reflecting on them together;
- discussing issues, such as changing trends in curriculum, instructional practices, and practical work; and
- refining draft worksheets on process skills.

³ At the time of the research there were 27 government (public) senior secondary schools existing across the country.

Concerning the draft worksheets, the intention was that the teachers should take these worksheets back to their respective schools, share them with their colleagues, and pilot-implement them with their students. They would then be able to share their experiences with colleagues from elsewhere and give feedback to their trainers at UB INSET. BTO was brought in to facilitate this activity, leading to a blended learning solution, which consisted of the following elements:

- workshop presentation of structured content, carrying out of practical activities, and live interaction among participants;
- printed material in the form of worksheets and other handouts;
- facilitation of the after-workshop interaction of participants.

As part of the training workshop programme, an introduction to online communities of practice and their value for professional teacher development was presented to all participants. Furthermore, there was a thorough discussion of how the BTO intervention would be integrated into the training. Although feedback from the teachers about the perceived value of BTO was positive, the common problem reported in most schools was limited access to the Internet, with three of the schools represented reportedly not having connectivity. The participants, who were all computer literate and who used computers in their work environment occasionally for administrative purposes, were shown how to access and use WebCT. Unfortunately, the Internet at the venue, the Media Centre for the MoE, was not available on the day the demonstration and practical activity were to be conducted. Therefore, those who faced problems accessing the BTO environment depended on the notes given to them and a demonstration by the researcher during school visits.

Since this was a research project and participation was voluntary, only 10 of the 18 teachers decided to take part in the online intervention. However, even the other teachers who did not agree to participate had access to BTO in case they wanted to be lurkers or retrieve any resources from the online environment. Of the three trainers, only one, who was the main player, volunteered to participate in the intervention. The data collected during the implementation stage came in these forms:

- participation data related to visits logged in and messages read or sent,
- questionnaire and interview data from teachers and ICT coordinators,
- observations during school visits by the researcher.

Reflective meetings were also held with the INSET people at the UB. Retrospectively, some officers in the MoE were interviewed to get insights into the policy dimension of the implementation environment. The outcomes of the implementation are discussed below.

Evaluation/Outcome

Enactment process and its outcomes.

This section analyses the outcome of the implementation of BTO. Upon returning to their respective schools the teachers were expected to complete the first online activity, which was intended to determine the accessibility, usability, and sociability of BTO and to familiarize the participants with the environment (Salmon, 2002). However a month passed without any evidence of activity in BTO. A visit was made to all of the participants; the round trip to the schools concerned covered 1,800 kilometres. From the questionnaire and interviews held with teachers, three themes emerged as to why they had not accessed BTO:

1. limited or no access to the Internet in schools,
2. time constraints due to various engagements during the school day, and
3. failure to access BTO for technical reasons.

After this visit there was some degree of activity in terms of access but still at a minimal level. By the end of the intervention period only five of the teachers logged into BTO and their combined total access episodes were nine. All five participants who accessed BTO entered the discussion forum and read (or at least opened) the messages posted mostly by the researcher. However, only three of the participants posted a total of four messages to the forum. The remainder of the messages originated with the researcher while the trainer never accessed the environment. Thus, overall, there was a paucity of involvement by the teachers and the trainer. A second visit at the end of the intervention period was essentially for debriefing purposes. It was also used to administer a retrospective questionnaire as well as to obtain verbal reflections by the teachers, where possible.

Individual teacher participants.

Data on individual teachers' experiences with BTO implementation was synthesised to develop an understanding of how their engagement contributed towards framing the enactment process and outcome. The data revealed that the teachers who participated in this research did so seemingly out of interest and a positive attitude towards the innovation. However, participation was very low, and this was attributable to the lack of time to do so, the lack of adequate and convenient access to the Internet, and the lack of activity within BTO. Internet access was the biggest challenge in schools not only because of the limited number of Internet-connected computers but also because of the limited times it was available to teachers. Therefore having analysed the teachers' involvement, it seemed that it was not the teachers' attitudes or unwillingness *per se* but rather it was the constraints in their workplaces, i.e., their respective schools, that led to their low involvement.

School environment.

The school ICT environment played a major role in shaping how these teachers got involved in this intervention. An investigation of the school environment, particularly data from schools' ICT coordinators, was helpful in obtaining a broader understanding of the issues surrounding ICT access in the workplace by teachers in Botswana. There is a serious shortage of ICT facilities, particularly the Internet, for teacher use in schools. This problem is aggravated by the way the limited ICT resources are managed: Internet connections are available in a limited number of places in the school and at limited times. Moreover, the quality of connectivity is very poor due to narrow bandwidths. While there is a general belief that ICT has the potential for developing positive educational outcomes there is very little in practice to support the rhetoric. There seems to be a relatively narrow view of this potential, with the dominant use of ICTs being that of accessing educational resources and transmitting information but with very little use related to the collaborative and participatory dimension.

This situation is not a school-level problem; it has systemic influences. While government schools might exercise some degree of autonomy, in terms of day-to-day management of resources and activities, they operate under policy guidelines and regulations of the MoE. Therefore the MoE's provision of ICT infrastructure to schools, and the rationales for doing so, affords or constrains learning opportunities for teachers in the workplace.

Policy environment.

The policy environment in which this intervention was conducted is complex and this paper can not do justice to it. A detailed analysis is offered in Boitshwarelo (2007). However, a brief description of the ecological influence of policy will be presented briefly. The RNPE and the National ICT policy documents, alluded to above, recognise the importance of ICT in the school curriculum and recommend adequate facilities in schools so that students can acquire ICT skills. While the policies recognise the importance of teachers acquiring ICT skills, less emphasis seems to be placed on the role of ICTs as tools for ongoing, interactive, and participatory TPD. This probably originates from a predominantly centralised approach to training, which emphasises the acquisition of knowledge and skills. The MoE sponsors and/or carries out INSET activities for all teachers in government schools and to that end it has built regional education centres around the country. Therefore most of the resources, like ICT facilities, are concentrated in these centres for teachers to use when they come for INSET activities, but there are very few resources in schools. The ICT facilities in these centres are usually inadequate and the level of support to users is low. On the other hand, the ICT facilities in schools are primarily meant for teaching activities and not for TPD purposes. Therefore, while there is growing awareness of the potential of ICTs for effective TPD, the reality is that this is currently not being harnessed as the existing policies do not reflect adequate strategies for optimal use even at school level.

INSET provider.

Other issues that significantly shaped the enactment of BTO had to do with the organisation that provided the INSET programme. In particular, issues of capacity, organizational structure, training approach, and commitment were identified as significant in determining how the intervention proceeded. In addition, the issues and challenges related to introducing innovation featured prominently as there seemed to be resistance to the intervention. The limited availability of time and resources also made it difficult to properly initiate the teachers into the innovation.

Discussion and Conclusions

The aim of this paper was to explore blended learning solutions in the context of Africa. In particular, the paper sought to explicate the pedagogic process of creating a blended learning solution and implementing it through a case study of teacher professional development in Botswana. The introduction of BTO to the INSET programme was essentially an attempt to use a blended learning approach for more effective training (Debande & Ottersten, 2004; Boyle, 2005). The purpose of this particular blend was to ensure that the traditional face-to-face method, which is acquisitive and static in nature, was enriched by BTO (an online method), which is participatory and collaborative in nature and could facilitate ongoing learning that is situated in the real school setting. In terms of the models introduced earlier (Kerrs & De Witt, 2003; Alonso et al., 2005), the workshop and its associated print materials (handouts) facilitated the acquisition of content (both at the knowledge and skills levels). On the other hand, the online intervention BTO was meant to support and enhance communication and collaboration in a temporally and spatially independent way. This intervention was seen not only as pedagogically appropriate but also as cost-effective and time-saving for both the institution and the teachers in terms of travel and of physical distribution of materials. However, while the blended learning solution was evidently well-conceived as it sought to attend to an authentic pedagogical and practical need, its implementation was not successful.

The synoptic evaluation described above indicated that an ecology of factors at different levels and from various directions impacted the intervention process and outcome. These were the target learners, the implementation environment, particularly the schools, and factors of a systemic nature, especially policy issues. Within this ecology a number of contradictions were identified, with the help of activity theory (Barab et al., 2002; Jonassen, 2000; Engeström, 1987; Cole & Engeström, 1993).

In terms of the target group, indications were that while these teachers seemed motivated and interested in BTO, their workplaces did not provide support, culturally or professionally, or resources, particularly ICT resources. At an individual level, the teachers lacked adequate ICT skills and confidence so that even where access was reasonably available they would give up if they encountered a technical problem. Lack of participation by others who were part of the online environment also had a discouraging effect. Thus, in some ways participation in BTO was a lonely exercise that required some level of cognitive effort in that it required engagement (Kerrs & De Witt, 2003).

With respect to the implementation environment, which was largely the schools of the respective participants, there was a tension between participation in BTO and workplace activity. The school was the implementation environment for BTO in the sense that the teachers were to depend on it for organisational, social, and technical support as they engaged with this learning environment. However, the school activity, whose primary objective is to teach students, opposed the BTO activity, whose primary objective was to train teachers. Thus, the socio-cultural, organisational, and technical environment was constraining to the teachers' participation in BTO. This manifested itself in terms of limited time during the school day or week for the teachers to engage in TPD activities, lack of ICT resources for teachers to use because they are used for teaching purposes, lack of leadership support for TPD activities, and a possible lack of collaborative learning cultures at departmental levels.

On the policy front, there was tension between the existing policies (or at least policy interpretations) regarding INSET for teachers' ICT use in schools and the object of BTO. Consistent with its policies and guidelines, the MoE uses a model of INSET that follows the acquisition metaphor, which is mainly characterised by a centralised, top-down approach to training. For this reason resources for training are mostly centralized, and ongoing teacher learning in schools is gravely affected. This systemic problem also has an impact on whatever innovations the UB can venture into for INSET as the initiatives are constrained by the reality on the ground. For example, notwithstanding the cultural, organisational, and capacity challenges associated with the INSET programme provider at UB, its guidelines and intentions are clear regarding the intention of vigorously pursuing, "...the possibility of creating a networking system for mathematics and science departments in schools, education centres and [UB-INSET] via Internet/E-mail..." (University of Botswana, 1997, p. 6). However, this has not been possible due to ICT facility constraints in schools.

To resolve the tensions identified during the implementation of BTO and indeed during any other similar intervention there is perhaps need for the following:

School environments should be supportive of on-going teacher learning in the workplace environment and should manage ICT resources prudently for optimal use not only by students but also by teachers. There should be more availability of these resources across space and time.

Government, particularly the MoE, should create a supportive policy environment matched by funding, resources, capacity building, and support for ICT-supported learning. The MoE should support participatory and localised learning and should institutionalise ICT access and use.

INSET providers, such as the UB, should commit to and provide appropriate training using blended methods, model good ICT practice to teachers, and provide ongoing support for teacher learning in the workplace. Networking among different teacher training stakeholders is also essential.

Concluding Remarks

This paper concludes by making the following four observations:

1. Blended learning solutions can be an appropriate approach to increasing access to higher and continuing education in sub-Saharan Africa. These solutions, however, need to be pedagogically grounded and their design should take into account not only the target learners and their immediate implementation environment but also systemic constraints and affordances.
2. Change is needed in the culture of teaching and learning if blended learning solutions, particularly the ICT aspect, are to be successful. It was evident in this research that the cultural structures and processes of the dominant acquisition model were not in compliance with the notion of online collaborative learning. Therefore there is a need for more balanced training that effectively blends not only delivery systems but also learning perspectives that incorporate, among others, ongoing, situated, participatory, and collaborative approaches.
3. A blend that involves ICT-supported workplace learning is of necessity a collaborative endeavour between at least two players: the training provider and the workplace. This is particularly so in Africa where home Internet access is almost nil and public access is either expensive or not conveniently available for learning purposes. However, while this collaboration is necessary and good, it can also bring tension when the activities of the different collaborators are at variance with each other. For example, in this project the computers in the school were primarily used for teaching purposes and this did not align well with intentions to support the INSET programmes with these facilities. This paradoxical situation could be resolved by initiating fundamental and systemic organisational changes in the teacher education enterprise in order to ensure that technological innovations are successful (Davis, 2002; UNESCO, 2002).
4. While there is rhetorical recognition of the importance of the Internet for TPD in policy documents, there are few, if any, strategies to optimise the use of these already meagre resources. This is an observation that has been widely made in the literature about technology in education in general (Dale et al., 2004; Hammond, 1994; Cuban 2001). Nicol and Watson (2003) identified a gap between the rhetoric about technology transforming learning and the actual reality with teachers and learners on the ground. Closing this gap requires not only skills but also a change in beliefs about ICTs in education.

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An Evaluative Study of a Distance Teacher Education Program in a University in Ghana

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Abstract

The study used an adaptation of Provus' discrepancy evaluation model to evaluate a distance teacher education program in the University of Cape Coast, the premier teacher education institution in Ghana. The study involved comparing performance data of the program as perceived by students and faculty/administrators to standards prepared from the program's design. Performance data was obtained by administering two survey instruments to a random sample of students and faculty/administrators. Discrepancies between performance and standards were reported. The study concluded that although there were some discrepancies between program standards and performance the program is fulfilling its purpose of upgrading the professional and academic performance of a large number of teachers in the public K-8 schools in Ghana.

Distance Teacher Education at the University of Cape Coast, Ghana

Distance education (DE) as a complementary mode of delivery was initiated as an effort to overcome the challenges of access, equity, cost-effectiveness, and quality for higher education (Association for the Development of Education in Africa [ADEA], 2002; Perraton, 2000). The suitability of DE for teacher preparation in particular is a topic of interest in many countries (Perraton, Creed, & Robinson, 2002; Shachar & Neumann, 2003).

Ghana, like other industrialized and developing countries, relies on DE to augment traditional face-to-face methods of teacher education (Perraton, Robinson, & Creed, 2007). Teacher preparation is well established in the country with 40 Colleges of Education that offer three-year postsecondary certificate "A" diplomas for teachers of basic education. Total annual matriculation of teachers from these institutions has been between 5,500 and 6,000 since 1995 (Akyeampong, Furlong, & Lewin, 2000). However, there is an acute shortage of trained teachers, created by an expansion of pre-tertiary enrollments due to rapid population growth, the success of basic education reform, and the inability of Colleges of Education to produce the required number of teachers because of inadequate infrastructure. This shortage is not limited to Ghana but is prevalent in all countries of sub-Saharan Africa (DeJaeghere, Chapman, & Mulkeen, 2004, 2006).

A study done in 2000 reported that to train all untrained teachers in Ghana by the year 2005 and to achieve a gross enrollment ratio of a hundred percent by the year 2010, the total number of new teachers required per annum would be from 13,000 to 16,000, and this output would have to be sustained up to the year 2010. Considering the current total annual output of trained teachers, meeting the demand for new teachers is a daunting task (Akyeampong et al., 2000; Akyeampong, 2001).

To overcome the shortage of trained teachers, education policy makers decided to employ the mass-production potential of distance education, identified by Peters (1971) nearly 40 years ago. DE is therefore used for in-service training of active but untrained teachers and for professional upgrading of already trained teachers in K-8 schools (Perraton, 1993; 2000; Perraton et al., 2002; Robinson & Latchem, 2002; Saint, 1999).

With the introduction of DE, the Ministry of Education (2002) intended to solve not only the shortage of teachers but also the high attrition rates often associated with study leave. In addition, the Ministry of Education wanted to ensure that teachers would not need to move from their duty stations to seek further education. They could remain at post and learn by integrating college work with their teaching work (Darling-Hammond, 1998). DE has the potential to stem high attrition rates of teachers and reduce the migration of teachers from K-8 classrooms to high school or college classrooms after they have received higher qualifications and have gained additional experience.

The Center for Continuing Education of the University of Cape Coast (CCEUCC) introduced a three-year diploma in Basic Education (DBE) program in 2001 and by 2006 had 8,336 students at 18 study centers in all 10 administrative regions. It initiated post-diploma (P-DBE) programs in the 2005-2006 academic year (Brown, 2004; Ministry of Education, 2002, 2004; Ossei-Anto, 2003).

Distance Education and Evaluation

Successful program development cannot occur without evaluation (Sanders, 2000). The value of evaluation, especially pertaining to DE, has been variously discussed. Calder (1994) and Thorpe (1988) have suggested several important reasons for evaluation in DE. Evaluation helps distance educators to gather information about learners and their needs and desires. It is needed because DE is still in its embryonic innovative stage and pioneering activities are still taking place within the industry. It assists distance educators in thinking about what they are trying to do and what they hope to achieve as they implement programs and activities. Evaluation can also provide information needed by external bodies, funding agencies, businesses, colleges, students, and other clients who want to know if DE accomplishes what it sets out to do. The literature on evaluation of DE mostly deals with comparison studies of one mode over the other, mostly correspondence over traditional, face-to-face DE, or of one medium over the other.

Program evaluation is the systematic investigation of the worth of an ongoing or continuing activity. There are as many different models of or approaches to evaluation as there are

philosophical underpinnings of definitions of evaluation. The needs of each particular program determine the evaluation model suitable for use (Simonson, 1997). The literature suggests that professional evaluators usually prefer an eclectic use of parts of various models, as Madaus and Kellaghan (2000) state:

Each evaluation approach has its particular strengths that can help illuminate different aspects of a program. Within the limitations of the budget, pick and choose features from various models that can provide the best evidence to answer questions about the project. For example, consider combining test data from a goals-oriented approach, resource allocation data from the decision-oriented approach, and observational and interview data from the naturalistic approach. (p. 25)

The Nature of the Problem

Teacher preparation by the DE mode of delivery was introduced in Ghana almost a decade ago to accelerate the production of trained teachers and to enhance the quality of teaching in K-8 schools. No standard has been articulated to measure the success of the program. Evaluation is crucial to the development of any program (Mark, Henry, & Julnes, 2000), yet despite the key role that evaluation plays in program development, no systematic formative program evaluation has so far been conducted in the country (Ministry of Education, 2002; R. Aggor, personal communication, May 15, 2005).

The purpose of this study was to evaluate the distance teacher education program at the University of Cape Coast, Ghana's premier teacher preparation institution.

The Research Question

The research question was, "how well is a large distance education program fulfilling its purposes for teacher education in Ghana?" Specifically, are there discrepancies between the standards for the design of the distance teacher education program in Ghana and the actual performance in the field?

Theoretical Perspective and Research Model

The research question was answered using an objectives-oriented, quantitative evaluation study, based on an adaptation of Provus' discrepancy evaluation model (DEM) (Provus, 1971). Provus developed this model for use as new programs were designed and implemented in the Pittsburgh public schools. He used a systems approach to determine whether program performance met accepted program standards. Provus conceptualized a three-step process of program evaluation: (a) defining program standards, (b) determining whether a discrepancy exists between some

aspect of the program performance and the standards governing that aspect of the program, and (c) using discrepancy information either to change performance or to modify program standards.

In Provus' original model, the evaluator is involved in the design of the program as well as the standards for assessment, in consultation with stakeholders. With the design and standards in hand, she evaluates each of the five stages of the program, namely design, installation, process, product, and cost, by comparing the standards with the performance. The comparison often shows differences between standard and performance (i.e., expected and actual); this difference is called *discrepancy*. Discrepancy information is provided to the program staff, giving them a rational basis on which to make adjustments in their program (Provus, 1971).

The DEM has been used in a variety of educational contexts. Householder and Boser (1991) included it in an assessment of the effectiveness of change in teacher technology education. Morgan (1999) used it to evaluate an educational technology program design and implementation in a community college in California. The Center for Evaluation and Research also used it to evaluate Oakland Unified School District's Urban Dreams Technology Challenge Grant Project (CER, 2001).

This study uses an adaptation of the DEM to evaluate an existing program at the University of Cape Coast, the largest such program in Ghana.

In preparation for stage one of the evaluation, the plan of the program was obtained from the University of Cape Coast. Following Steinmetz (2000), a component analysis of the design was performed. The program was broken down into five major activities or components using Rumble's (2002) categorizations, namely student-teacher achievement, course material production, tutoring, classroom supervision, and administration. This provided a conceptual model, or a program map, which showed how the program looked and facilitated component analysis. It included (a) the inputs for the whole program (resources provided by the Ministry of Education, the University of Cape Coast, and the Commonwealth of Learning); (b) the process for the whole program (the development and implementation of distance teacher education); and (c) the output (i.e., to provide higher academic and professional training for basic school teachers, raise performance level of teachers, and equip teachers with skills for lifetime learning). It also includes the five components mentioned above (see Figure 1).

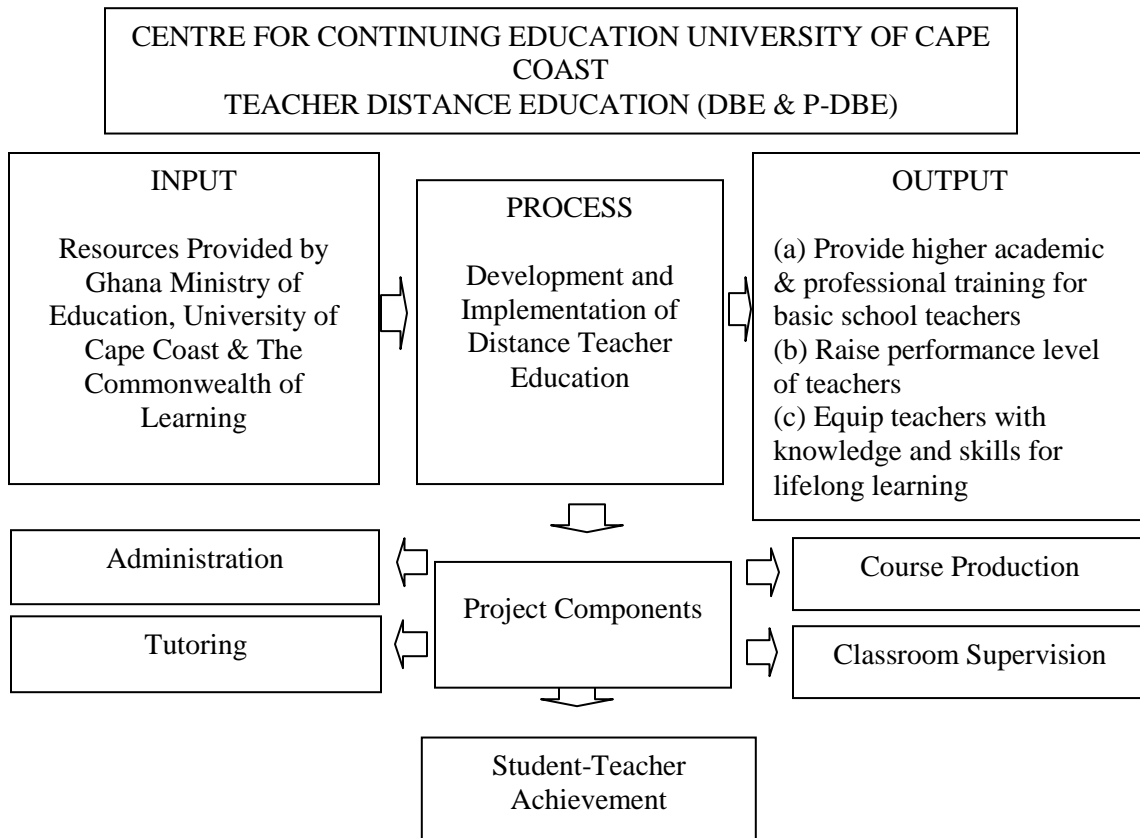


Figure 1. Program map of the plan of CCEUCC, showing the input, process, and output, as well as the project components.

From this program map a component analysis was derived. It consisted of input-process-output (IPO) narratives for each component, along with what Steinmetz calls a “program network,” showing all components and subcomponents and the major relationships among them (see Figure 2). With this design in hand, an official of CCUECC was interviewed concerning the view of the administration on what the ideal program should look like. The standards for the program were written specifying the intent or expectations of the program. The standards were based on the answers received from this interview, the objectives of the program, and the ADEA Report (2004), which contains critical success factors for DE in Africa.

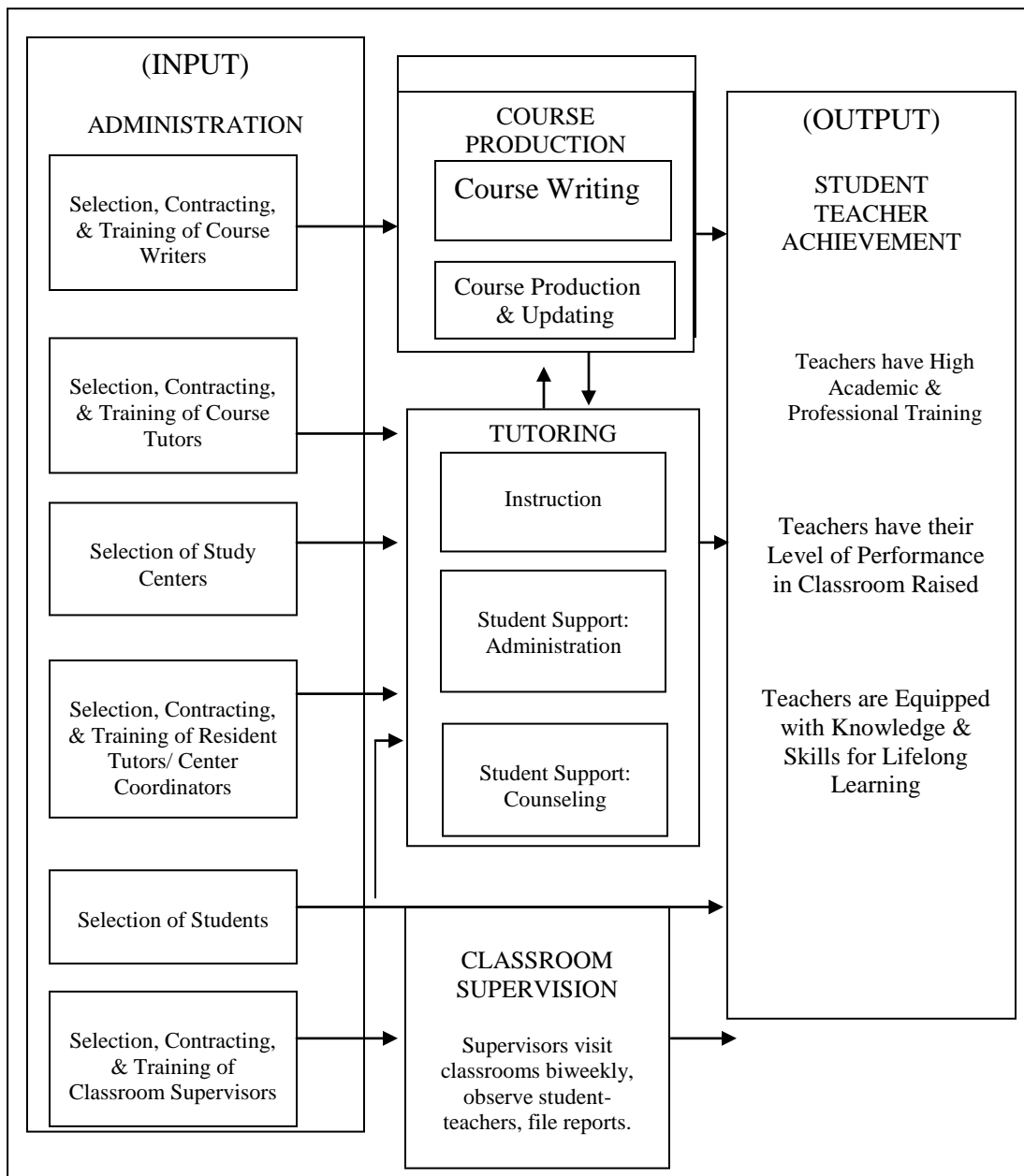


Figure 2. Program network showing the various components and the interconnections between them.

Program Narrative

The University of Cape Coast was established in 1962 and mandated to train graduate professional teachers for the country’s high schools and to assist with training of teachers for the K-8 schools through its graduates, who teach in the Colleges of Education of Ghana. The university was instrumental in the design and implementation of the Education Reforms of 1987. Challenges that emerged with the implementation of the education reforms included the need to

increase the number of qualified teachers in the basic schools to keep up with a recent expansion in enrollment in basic education and the need to improve academic and pedagogical competencies of the bulk of teachers in the basic schools. The Centre for Continuing Education was established to mount two programs to train teachers through distance education. By providing a viable distance learning program, the Centre seeks to achieve the following:

- provide higher academic and professional training for teachers in the basic school,
- increase access to university education,
- raise the performance level of teachers in the basic schools and personnel of the Ghana Education Service, and
- equip students with knowledge and skills for lifelong learning. (CCEUCC, n. d.)

Methods and Procedure

The study sought to examine the perceptions of the teacher trainees as well as faculty/administrators to ascertain gaps, if any, between standards and performance of the distance teacher education program of the University of Cape Coast. This was done by administering two sets of questionnaires to two groups of people: students and faculty/administrators.

The Setting and Sampling

The research site, the University of Cape Coast in Ghana, has over 8,000 distant teacher trainees in its program, scattered across the country. They are involved in two programs: a three-year diploma in Basic Education (DBE), and a higher, two-year post-diploma degree in Basic Education (P-DBE). Student teachers from both programs were included in the study because the two programs together constitute the University's work in distance teacher education. Out of this total population, second and third year DBE students and all P-DBE students were used for this study, making a select population of 6,897. Responses from the student teachers from the two programs were not differentiated because the two programs are very similar and differ only in terms of the specific content of their courses, with the P-DBE following the DBE.

A random sample of 365 students and 186 (out of 350) administrators and faculty members were obtained. Two sets of survey questionnaires were developed and pretested by the researcher and were administered to the students and faculty/administrators with the help of coordinators at the various study centers. Usable returned questionnaires yielded a response rate of 41% of students and 42% of faculty/administrators.

Analysis of the Data

Returned questionnaires were manually entered into a spreadsheet and analyzed at two levels. First, descriptive statistics were calculated in the frequency count and percentage of responses for

each item. These gave the number of respondents and the frequency of respondents who marked Strongly Agree, Agree, No Opinion, Disagree, and Strongly Disagree.

A second level of analysis of the data was done by collapsing the categories of responses to present the composite counts and frequencies of those who had either agreed or disagreed.

Stage One Evaluation

The first stage of the evaluation included deriving the design of the program from the documents provided by the university. The standards of the program were derived from the program design, from interviewing an official of the university, and from a review of the literature. Finally, the curriculum was assessed by two people, one with a Ph.D. in Education and the other with an Ed.D., both of whom have done extensive work in the area of curriculum. This phase of evaluation was crucial for it enabled the researcher to formulate the statements on the survey questionnaires to elicit the perceptions of the student body as well as the faculty/administrator group. It was determined that it was possible for CCEUCC to implement a viable program and that expert reviews found the curriculum appropriate for teacher education.

Stage Two Evaluation

The second stage of the evaluation measured installation of the program. An analysis of responses indicated that some issues needed to be dealt with in order to close the gap between the design and the installation of the program. The students' and faculty/administrators' positive responses were 63.74% and 58.18% respectively, and their average percentage was 62.59. This represented a relatively high rating of the installation of the program by both groups. However the low positive scores from respondents regarding two major issues, raised in the open-ended comments, indicated some discrepancy.

The first issue that needed to be addressed was the lack of computers with Internet connectivity at the study centers, which were meant to enhance research and easy communication among students and between students and course tutors. This was a concern for both students and faculty/administrator groups given that this item received the lowest positive response from both groups.

The second issue was the frequency and effectiveness of classroom supervision; this item received less than 50% positive response from student respondents. Two students suggested in the open-ended section that classroom supervision "needs improvement." However they failed to indicate the kind of improvement in supervision that was needed (which could be either the frequency of supervision, or the quality of supervision, or both). Nevertheless the students' response was confirmed by the faculty/administrator group who also gave a low rating (28.1% agreement) to a similar item on whether supervisors' reports are analyzed and used to improve the program. Three faculty/administrators suggested that there was the need for provision of vehicles at the various learning centers to enhance effective supervision, especially of student-teachers stationed in remote and inaccessible rural areas. This suggests that supervisors might be

facing logistical problems and are therefore unable to perform their supervisory duties satisfactorily.

One more issue of concern to both student and faculty/administrator groups was the financial burden of the payment of tuition and the purchase of study manuals by the student teachers. This concern came from 18 student respondents and from two faculty/administrators on the open-ended section. It is the opinion of the researcher that this complaint stems from the fact that the government has traditionally provided scholarships and stipends for student teachers in the various Colleges of Education. Therefore student teachers involved in the program do not understand why the same benefit is not extended to them. The frustration of the student teachers about this was summed up by a statement from one of the respondents: “As a teacher in the classroom, I feel I should get support from the government.”

Two students and one faculty/administrator expressed a desire for the distance learning program to be separated from the main university administration. Their reason was to enhance efficient management, indicating a lack of satisfaction with the way the program was managed. Faculty/administrators did not rate positively the item about whether learner information is collected, stored, and used on a consistent basis, again showing concern about a lack of efficient management of information storage and retrieval systems.

Also there was one comment each from a student and a faculty/administrator on the need to create more learning centers. Two faculty/administrators suggested that course tutors must be involved in course writing; and one faculty/administrator suggested that there should be more coordination between administrators and tutors.

Discussion of stage two evaluation.

Tait (2000; 2003) suggested that student support services perform cognitive, affective, and systemic functions. The cognitive learner support function develops learning through the course materials and resources for students; the affective student support function provides an environment that helps students, creates commitment to learning, and enhances students' self-esteem; and the systemic learner support function establishes administrative procedures and information management systems characterized by efficiency, transparency, and student-friendliness. Tait's systemic learner support function seems to be lacking in the implementation of the program. Respondents agreed that information gathering and an information storage system were needed. They agreed that supervisors and tutors did not collect information from students for transmission to headquarters to be stored and retrieved for further planning. According to an ADEA Report (2004), effective distance education requires the collection, maintenance, and use of learner information. The report further states that “management of information is needed – monitoring information will enable providers to identify and act to support inactive or at-risk learners” (p.13).

Furthermore, there seemed to be no supervision of the supervisors, who were charged with observation of the student-teachers in their classrooms to ensure that they were practicing what

they were taught. On paper, supervisors were expected to visit students and to observe their teaching on a biweekly basis then write a report. However both student and faculty/administrator respondents agreed that this was not being done effectively. Faculty/administrators suggested that provision of vehicles at the study centers would enhance the work of supervisors, especially those who have to travel to distant rural areas where student teachers are stationed.

Stage Three Evaluation

The third stage of the evaluation measured the extent to which interim products compared with the standards. The interim products were identified as the course manuals, the materials distribution processes, the course delivery systems, and the student support systems. An analysis of the responses in this section of the questionnaire indicated that the students' positive response was 73.22%. Among faculty/administrators' 69.26% responded positively. The average positive response rate for both groups was 72.40%.

Two statements received positive responses lower than 50% in this section. The first is the item that indicated that the students would have liked to have had more contact with their course tutors, which received 82.9% agreement from students. This implied that only 17.10% were satisfied with the contact they had with their tutors. The second statement inquired whether the tutors returned graded assignments to them in a reasonable time, which yielded 45.5% agreement.

The percentages of faculty/administrators' positive responses were lowest on two statements: there is a time block earmarked for one-on-one interaction between instructors and students who need it, and course writers actually visit study centers and try to get feedback from students and course tutors on how their manuals are used. The former statement corresponds to the item on the student questionnaire that asked about students' satisfaction with the contact with their course tutors, which showed only 17% agreement.

Responses in the open-ended commentary section indicated that students felt that the courses were overloaded, and they had difficulty balancing their roles as adults, teachers, and students, a concern shared by one faculty/administrator. They also complained about the quizzes and examinations, saying that they were not given adequate time to complete them, and their complaints were not dealt with satisfactorily. This was also supported by faculty/administrators, who suggested more emphasis on staff development to enhance student support.

Another critical comment from both student and faculty/administrator groups was that course manuals were not properly edited, revised, and distributed, and that sometimes students did not receive their materials at the beginning of the semester.

In spite of these problems, the 71.24 percentage of positive responses in the questionnaires indicates a relatively small gap between perception of performance and standard. Thus both student and faculty/administrator groups rate the performance of the program highly.

Discussion of stage three evaluation.

Tait's (2000; 2003) affective learner support function seems to be lacking in this program. A majority of student respondents agreed that they needed more contact with tutors (faculty), and tutors agreed they did not have a time block allocated to one-on-one contact with students during the biweekly face-to-face seminars at the study centers. This indicates that learners' need for more contact with course tutors seems to have been neglected in designing the program. In a situation where contact with tutors by way of email and telephone is difficult due to the inadequacy of information and communications technology facilities in the country (Butcher, 2003; Saint, 1999) and especially in rural contexts, this is a serious drawback. According to Tait, learner support should be personalized in such a way that learners' needs are responded to immediately.

Zhao et al. (2005) observe that as a distance education program increases the opportunity for more interaction, it increases the chance of being better rated than its face-to-face counterpart. They again observe that distance education becomes more effective when there is a "live" instructor present, i.e., either occasional face-to-face contact or contact through an information technology medium.

Thorpe (2003) suggested that learners need support in two areas: institutional systems and course materials. Institutional systems support includes publishing which courses are available, how to apply, how to make payments, etc., before, during, and after the course of study. Course materials support includes answering learners' questions on how to make sense of something in the course materials, how to complete a particular assignment, how to contact other students, and other related services. The program of the Center for Continuing Education of the University of Cape Coast needs to be strengthened in both areas of learner support. The second area of support emphasizes personal contact with tutors. Although provision has been made in the program for biweekly face-to-face seminars, there has been no provision for one-on-one student-tutor advising.

Open-ended responses indicated that there is no identified process of development and evaluation of course manuals. The implication is that only a few course writers were contracted to write the course manuals, and there was no mechanism for feedback from the course tutors and students who used them. Feedback about course materials from students, tutors, and study center coordinators must become a part of the materials revision process. This would help to make the course materials learner-centered, clear to the students, and self-explanatory. Furthermore, it is crucial to ensure efficient distribution of materials to students at the beginning of the semester in order to avoid wasting time.

Students need to be encouraged to be independent learners. The more independent students' learning becomes, the more competent they will feel and operate. This would decrease their need for access to their tutors (Grow, 1991; Wlodkowski, 1999). Faculty responses indicated that approximately 70% encouraged their students to consider comments on their graded assignments as dialogue and 30% did not. This compares to student responses to a similar question about

whether they regarded comments on their graded assignments as dialogue, to which 75% responded in the affirmative and 25% responded in the negative. Brindley (1995) suggested the end goal of learner support to be the enhancement of independent learners and empowerment of students, which is all the more pertinent in this program since students are adult learners and practicing teachers. They need to be guided to move through the three intermediate stages identified by Grow (1991) as dependent, interested, and involved towards the ultimate goal of self-directed learning. This is the only way they can move from Schon's (1987) knowing-in-action to reflection-in-action. It is important to develop effective, reflective teacher practitioners (Darling-Hammond, 1998) and to achieve the program's objective of equipping student teachers with the skills of lifelong learning.

Stage Four Evaluation

The fourth stage of the evaluation measured terminal products, the academic and professional competence of students. An analysis of student responses indicated that 78.05% of students' responses were positive. Almost all students (94.3%) agreed that the program contributed to their academic and professional development. The next highest percentage of positive responses was to the statement about whether they would recommend CCEUCC correspondence courses to their friends, relatives, etc. who are in the teaching profession, to which 80.5% responded positively. The statement that they prefer DE to classroom instruction yielded a rather low positive response of 41.5%. Positive responses by faculty showed that 93.8% agreed with the statement that the distance teacher education program has had a positive impact on teacher education in Ghana, and 90.6% agreed that the students were utilizing what they learned in the program in their classrooms.

The percentage of positive responses for the stage four evaluation was 78.05% for students and 92.2% for faculty/administrators, with an average percentage of 80.97%, which shows that both groups gave the highest rating to the stage four evaluation..

The comments of both student and faculty/administrator groups were very complimentary to the program. Both groups agreed that the program was helping to upgrade the professional and academic competence of the student teachers.

Discussion of stage four evaluation.

Students agreed that the distance education program contributed to their academic and professional development, and they would recommend the program to their friends and relations, yet, at the same time, they indicated their preference for a face-to-face program. This seems contradictory, but it is consistent with the literature. Alexander et al. (2003) reported that it took online students more time than students in traditional classrooms to complete course objectives. Allen et al. (2002) conducted a meta-analysis using 23 studies and concluded that while the difference in levels of academic achievement between students involved in both

traditional and distance education is insignificant, both groups tended to prefer traditional education over DE.

Teaching has been considered to be a matter of skill rather than a matter of acquiring information. According to Shulman (2004), teaching requires basic communication skills, content knowledge, and pedagogical skills. Yet both the students and the faculty confirm that a DE program has enhanced the professional capability of teachers. Perraton et al. (2002) affirm that teacher preparation mostly comprises a balance between four elements: improving general educational background, increasing knowledge and understanding of the content area, enhancing pedagogy and the understanding of children and their learning, and developing practical skills and competencies. Perraton et al. suggested that the underlying purpose of a particular teacher education program determines the proportion and mix of these elements, and where the emphasis has been to raise teachers' background education or where the program is designed to help experienced teachers learn about a new subject, classroom activities have not been given much emphasis.

In the case of practical skills acquisition in a distance teacher education program, the component of practicum has been considered to be very important. Perraton et al. (2002) have itemized different examples of distance teacher education programs, which show different levels of practicum compositions: (1) no practicum at all; (2) college-based micro teaching; (3) classroom-based practicum as a separate block in a course, usually placed after academic blocks; (4) classroom-based practicum supervised by staff from college; and (5) classroom-based practicum under the guidance of a mentor within the school.

CCEUCC has contracted supervisors (trained teacher educators in regional and district offices of the Ghana Education Service) and tutors of training colleges to visit the student teachers' classrooms biweekly to observe the student teachers in action and to send reports to the Center. Teacher preparation at a distance has a potential advantage over traditional education because it is possible to integrate theory and practice by enabling practicing teachers to stay on the job while raising their skills. This might be the reason for the high rating of the program by the student teachers and faculty. The students who participated in this study are already involved in teaching, and therefore it is easier to transfer the concepts they are learning to the classroom. The positive responses for the participants in this study indicate that pre-service teacher education at a distance may also work as effectively if the practicum component is designed properly and is well supervised by experienced master-teachers.

Admittedly, the success of the program under review should be measured by principals, senior teachers, or outside evaluators, who would compare the teachers' effectiveness in the classroom with a control group, being their counterparts who did not benefit from the distance education. However, time and other constraints prevented this.

Conclusion

The distance teacher education program of the Center for Continuing Education of the University of Cape Coast (CCEUCC) is fulfilling its purpose of upgrading the academic and professional competence of a large number of teachers in the basic schools in Ghana, raising their performance level and equipping them with skills for lifelong learning. The gap between these objectives and the program's performance, as perceived by students in the program, faculty, and administrators, is not so big that it cannot be closed. Constant review of performance is needed to completely close the gap. Further, this program would be enhanced if students and tutors were able to provide feedback to the course writers about the manuals of instruction.

Nevertheless, CCEUCC has proven that teacher preparation at a distance is effective. Distance education is feasible over a broad geographic area. It enables students to obtain the necessary education without disrupting the life and work of students. Distance education can provide an effective and efficient solution to the perennial shortage of trained teachers in both developed and developing worlds.

This study adds to the body of literature on the effectiveness and comprehensiveness of Provus' discrepancy evaluation model as a well tested systemic approach to the evaluation of academic programs.

Recommendations

The conclusion of this study has several implications for the CCEUCC specifically. Distance learning is a lonesome endeavor and the policy makers need to do whatever they can to ensure the provision of adequate learner support services in order to reduce the transactional distance between the learner, the tutor, and the administrative personnel. Since CCEUCC is providing a distance learning program in a developing country, it needs to seek to reach the optimum level of learner support in view of the limited availability of information and communication technology.

Successful program development cannot occur without evaluation (Sanders, 2000). CCEUCC therefore needs to add evaluation to the program, for without evaluation there is no feedback from the clients and other stakeholders. Without evaluation, the program cannot be aligned to the needs of the clients and stakeholders, and their satisfaction cannot be guaranteed.

Independent, self-directed, lifelong learning does not take place automatically (Brindley, 1995; Grow, 1991; Knowles et al., 2005; Wlodkewski, 1999). Without independence and self-direction, distance learners cannot successfully achieve their goal of learning; therefore, providers of distance education need to develop a deliberate policy towards developing these attributes in their clients. CEUCC needs to include more learner-centered strategies into their teaching methodology. This will empower distance learners to own their learning and to assume more responsibility for their own success.

More broadly, the conclusions of this study suggest that distance education can be very effective with sufficient investment in time and planning. The major areas of administration, course production, learner support, classroom supervision, choice of appropriate media, evaluation, and its end product of student achievement require adequate investment in resources and planning.

Educational systems facing a shortage of professionally trained teachers should strongly consider DE. It has been proven to be very effective if it is well planned and implemented. The literature shows that it has worked effectively in training teachers all over the world, developed and developing, including Africa, Brazil, Britain, China, Columbia, India, Indonesia, and the South Pacific. DE is suitable for both initial teacher education and continuing professional development. It has the added advantage of keeping teachers at post so they do not have to leave their jobs while receiving further professional development. DE has helped to bring education to the doorsteps of students who are unable to meet their educational needs in conventional institutions.

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Appendix A

Students Survey Instrument

Please indicate your answer to the following items based on your experience with the Center for Continuing Education of the University of Cape Coast Distance Education program which you are currently involved. Circle the position that best represents your opinion.

1.	The admission information was easily understood.	Strongly Disagree	Disagree	Agree	Strongly Agree
2.	The admission forms were designed to be easy to complete.	Strongly Disagree	Disagree	Agree	Strongly Agree
3.	The admission personnel were helpful.	Strongly Disagree	Disagree	Agree	Strongly Agree
4.	The Continuing Education catalog presented information which was easy to understand.	Strongly Disagree	Disagree	Agree	Strongly Agree
5.	The orientation seminar was beneficial.	Strongly Disagree	Disagree	Agree	Strongly Agree
6.	I received course materials in time at the beginning of the semester	Strongly Disagree	Disagree	Agree	Strongly Agree
7.	The course manuals contained course objectives so I had a general idea of the structure and direction at the beginning of the course	Strongly Disagree	Disagree	Agree	Strongly Agree
8.	The manuals were easy to read and understand	Strongly Disagree	Disagree	Agree	Strongly Agree
9.	The graphics in the manuals were clear and self-explanatory	Strongly Disagree	Disagree	Agree	Strongly Agree
10.	The examples in the manuals were realistic to my classroom experience as a teacher	Strongly Disagree	Disagree	Agree	Strongly Agree
11.	The course tutor returned graded assignments to me in a reasonable length of time.	Strongly Disagree	Disagree	Agree	Strongly Agree
12.	The course tutor provided me with positive feedback during the course	Strongly Disagree	Disagree	Agree	Strongly Agree
13.	I felt comfortable communicating with the course tutor concerning my studies.	Strongly Disagree	Disagree	Agree	Strongly Agree
14.	I felt comfortable communicating with course tutor concerning my personal problems.	Strongly Disagree	Disagree	Agree	Strongly Agree
15.	During monthly face to face tutorials course tutors related to me more as facilitators of self-directed learners rather than as transmitters of information.	Strongly Disagree	Disagree	Agree	Strongly Agree
16.	The study center coordinator answered all my questions adequately.	Strongly Disagree	Disagree	Agree	Strongly Agree

Students Survey Instrument (continued.)

17.	I regard comments on my returned assignments as a dialogue rather than a directive from the course tutor	Strongly Disagree	Disagree	Agree	Strongly Agree
18.	Tutorials at the study center are student-centered instead of teacher-centered.	Strongly Disagree	Disagree	Agree	Strongly Agree
19.	I would have liked to have had more personal contact with the instructor.	Strongly Disagree	Disagree	Agree	Strongly Agree
20.	The course manuals encourage collaborative work among us students.	Strongly Disagree	Disagree	Agree	Strongly Agree
21.	My classroom supervisor appointed by the University visited my class room at least twice each semester.	Strongly Disagree	Disagree	Agree	Strongly Agree
22.	My classroom supervisor was a source of information at every visit.	Strongly Disagree	Disagree	Agree	Strongly Agree
23.	The supervisor's visit always made me nervous.	Strongly Disagree	Disagree	Agree	Strongly Agree
24.	The supervisor's visit to my classroom helped me to connect my course work to my classroom teaching practice.	Strongly Disagree	Disagree	Agree	Strongly Agree
25.	I had access to a computer at the study center with internet connectivity to do my research and send emails to my course tutor.	Strongly Disagree	Disagree	Agree	Strongly Agree
26.	Test questions often consisted of a test of critical thinking skills	Strongly Disagree	Disagree	Agree	Strongly Agree
27.	Test questions often consisted of only a test of memorization abilities.	Strongly Disagree	Disagree	Agree	Strongly Agree
28.	Course assignments often required research writing.	Strongly Disagree	Disagree	Agree	Strongly Agree
29.	I prefer correspondence study to classroom instruction.	Strongly Disagree	Disagree	Agree	Strongly Agree
30.	I would recommend UCC correspondence course to my friends, relatives, etc. who are in the teaching profession.	Strongly Disagree	Disagree	Agree	Strongly Agree
31.	I found the educational experience personally rewarding.	Strongly Disagree	Disagree	Agree	Strongly Agree
32.	This course contributed to my academic development.	Strongly Disagree	Disagree	Agree	Strongly Agree
33.	This course contributed to my professional development.	Strongly Disagree	Disagree	Agree	Strongly Agree
34.	The advisors motivated me to complete the course.	Strongly Disagree	Disagree	Agree	Strongly Agree

35. Is this your first correspondence program?

(a) yes.

(b) no.

If no specify which correspondence course you have involved in before in space below

Student s Survey Instrument Continued.

36. How many years were you teaching before enrolling in the Center for Continuing Education program? _____

37. What was your initial qualification before enrolling in this correspondence program?

38. How many hours per week do you devote to the course?

39. Feel free to write below any other information you would like to add the enhance my understanding of your feeling towards the program

Appendix B

Faculty/Administrators' Survey Instrument

Kindly indicate your answer to the following items based on your experience as a faculty member or administrator. Circle the position that best represents your opinion.

1.	I believe the study centers are adequately equipped with furniture for learning to take place there	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
2.	The study center I am familiar with has the necessary communication equipment i.e. telephone and computers with internet connectivity	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
3.	Learner information is collected, stored and used on a consistent basis	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
4.	Data collected about the program are analyzed and used for the improvement of the program	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
5.	The turnaround time of students' assignment is reasonable	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
6.	Learning and assessment methods are appropriate to the purpose and outcomes of the program	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
7.	The courses are coherently designed and packaged	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
8.	The tutorials are student-centered instead of teacher-centered	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
9.	The content of the courses and practice of tutors encourage collaborative learning	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
10.	The course materials are accessibly presented	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
11.	The course materials present information in a coherent way that engages the learners	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
12.	There is an identified process of development and evaluation of course materials	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
13.	The course materials encourage learners to exercise their inquiry abilities through constructivist approaches	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
14.	The course materials encourage reflection and connection between theory and practice	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
15.	The course materials take into consideration different learning styles of students	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
16.	Assessment is done in a way that minimizes stress for learners by making the process transparent,	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree

	supportive and affirming while not compromising on the standards required					
17.	Learner support is an integral part of the design of the program	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
18.	There is time block earmarked for one-on-one interaction with tutor for those who need it.	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
19.	I feel adequately prepared to offer student support by means of counseling	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
20.	Course tutors/supervisors/study center coordinators often do counseling to students	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
21.	Course tutors use different modes of instruction, (e.g. lectures, discussion, role-playing, overhead projectors, etc.) during face to face seminars.	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
22.	The program integrates encouragement of peer support structures	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
23.	Course tutors act as facilitators of self-directed learning instead of didactic transmitters of information	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
24.	The program integrate staff development in such a way that all staff are continually learning as they contribute to the functioning of the program	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
25.	Course writers actually visit study centers and try to get feedback from both students and tutors on how their manuals are used	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
26.	Efficient administrative systems support the activities of the program	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
27.	Tutors encourage student-teachers to regard tutors' comments on marked scripts as a dialogue and not a directive	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
28.	There is an integrated framework at a policy and practice level that informs a clear cycle of planning, implementation, monitoring, reflection and action to ensure that learners' and staff needs as well as the needs of other clients are met	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
29.	Information about scope, requirements and benefits of the program is disseminated in such a way that every potential learner receives it.	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
30.	Supervisors often visit student-teacher's classroom	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
31.	Supervisors' bi-weekly reports are analyzed and used to improve	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree

	program					
32.	There is a mechanism in place to ensure that supervisors visit student-teachers' classroom	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
33.	In my estimation, student-teachers are utilizing what they are learning through this program in their classroom	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
34.	In my estimation, the Distance Teacher Education program of CCEUCC has had a positive impact on teacher education in the country	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree

35. Kindly circle your position below:

- (a) Course Writer,
- (b) Course Tutor,
- (c) Classroom Supervisor
- (d) Study Center Coordinator

36. How far away from the study center/ student-teachers' classroom are you

37. What means of transportation do you normally use?

38. Feel free to write below any other information you would like to add the enhance my understanding of your feeling towards the program



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Harnessing Open Educational Resources to the Challenges of Teacher Education in Sub-Saharan Africa

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Abstract

The challenges to teacher educators in sub-Saharan Africa are acute. This paper describes how the Teacher Education in Sub-Saharan Africa (TESSA) consortium is working within institutional and national policy systems to support school-based teacher professional development. The TESSA consortium (13 African institutions and 5 international organisations delivering teacher education across 9 countries) designed and produced a bank of open educational resources (OERs) to guide teachers' classroom practices in school-based teacher education. Drawing on examples from the TESSA consortium and from the University of Fort Hare, South Africa, the authors categorize the forms of TESSA OER integration as highly structured, loosely structured, or guided use. The paper concludes by outlining success factors for the integration of OERs: accessibility, adequate resources, support for teachers, accommodation of local cultural and institutional practices, and sustainable funding.

Keywords: Open educational resources; sub-Saharan Africa; teacher education; school-based teacher development; TESSA

Teacher Education and Open Educational Resources

Teacher education now lies at the heart of all development schemes. It has already been recognized as one of the major areas of focus for poverty reduction, economic progress and social and cultural development. Development initiatives...affirm the critical importance of education and the role played by teachers. (Teferra & Skauge, n.d., p. 3)

Education is critical to many development initiatives. But, at the same time, there is widespread recognition that there are enormous global challenges facing the education sector. Foremost amongst these is the severe shortage of teachers in countries where they are most needed; to meet the challenges of the Education for All (EFA) goals, somewhere between 15 and 35 million new teachers are required globally by 2015 (UNESCO, 2007). In Africa, south of the Sahara alone, it is estimated that approximately 4 million *additional* teachers will be needed to fill both new posts and vacancies (to deliver a complete course of primary schooling for all children); this need is due to attrition caused in particular by the effects of HIV/AIDs and the migration of trained teachers into other sectors of the economy and other countries outside of the region (UNESCO, 2008).

The challenge is to ensure a well-prepared, engaged, and committed corps of teachers in sufficient numbers, whilst working within budgetary and infrastructure constraints. In developing countries this challenge is amplified by the significant numbers of un- and under-qualified teachers; these teachers urgently need access to professional development opportunities. Across sub-Saharan Africa the minimum level of qualification required for teachers varies, but these standards are generally lower in sub-Saharan Africa than in other regions. Even so only four countries report all teachers meeting their requirements (UNESCO, 2006). In the Congo and Mozambique less than two-thirds of teachers meet the minimum international standard of lower secondary education. This lack of training impacts on pupil achievement; in developing countries evidence is emerging that the strongest school-level determinant of pupil achievement lies in the quality of teaching (Adekola, 2007; Schwille et al., 2007).

Despite the urgency created by these challenges, Kirk and Dembélé (2007, p. 1) caution that, “Short-term responses to teacher shortages can ensure that every classroom has a teacher, but raises concerns about the impact on the quality of teaching and learning.” Quality has to be a fundamental criterion, but responses to these challenges also need to take into consideration contextual and environmental factors, in particular the lived reality for many teachers.

However, as Weber argues (2007, p. 293), “The job of teaching in poor countries is defined by the struggle to cope in the absence of basic resources and the consequences of structural adjustment programmes.” Chronic underfunding, corruption, and instability related to frequent political and policy changes contribute to difficult working conditions in many areas of sub-Saharan Africa. Teacher motivation, aspiration, and morale are important contextual factors, and it has to be borne in mind that “(many) teachers in conflict-affected, emergency or post-crisis situations may not originally have intended to enter the profession, but did so to respond to the needs of their communities or to the lack of other livelihood opportunities” (Kirk & Dembélé, 2007, p. 2).

Given these kinds of realities, how best can effective teacher training that promotes quality education be delivered? Teacher training colleges and institutions have limited capacity to expand, and there is an imperative to retain existing teachers in classrooms with their pupils whilst they engage in professional development. As well, it is important to focus on what actually happens in teachers’ own classrooms rather than on guides, suggestions, and theories of what

should happen in classrooms (Schwille et al., 2007). This requires teachers who are empowered to think about their work with their peers and to both provide and get feedback on what they do. In Japan and China, these ideas have found successful ‘take-up’ through the establishment of *jugyokenkyu* (lesson study) and *jiaoyanzu* (teacher research) (Schwille, 2007).

Such works, and several recent reports, make the case for urgent new thinking about the forms and structure of teacher education (UNESCO, 2007; UNESCO, 2008). At the re-launch of the Partnership for Higher Education in Africa (September, 2005), Dr Kofi Annan made the following appeal: “We need to train teachers and build up research capacity; we need to strengthen open universities and distance learning programmes; and we need to ensure that African institutions have access to the latest technologies” (2005, October 3).

Across the globe there is increasing interest in different forms of school-based modes of teacher education and in using the tools offered by new information and communication technologies (ICT), including open educational resources (OERs), for large-scale provision (Moon, 2007). These initiatives not only increase capacity for teaching training systems but also offer opportunities to enhance the articulation between theory and practice and to support teachers more effectively in becoming reflective practitioners. Recent reports from the sub-Saharan African region indicate some ambitious experimentation but, as yet, few initiatives utilizing educational technologies within the training process itself (Farrell et al., 2007).

School-based teacher development programmes demand resources and reference materials to guide and grow teachers’ classroom practices; these are frequently scarce in sub-Saharan Africa. But the recent advent of open content or open educational resources (OERs), a global intellectual resource of teaching materials, offers a significant breakthrough. This paper describes how the Teacher Education in Sub-Saharan Africa (TESSA) consortium is working collaboratively within institutional and national policy systems to develop and use OERs to support innovative school-based professional development (Wolfenden, 2008). We reflect on the range of approaches to the use of OERS observed in the consortium to date and suggest key areas for further exploration in the use of OERs.

TESSA (Teacher Education in Sub-Saharan Africa)

TESSA is a research and development project working to improve the quality of, and extend access to, university-led primary school teacher education. Since its inception in 2005 the TESSA consortium of 18 institutions has worked collaboratively to design and build a multi-lingual OER bank, modular and flexible in format (see www.tessafrica.net); core funding for TESSA is from the Allan and Nesta Ferguson Charitable Trust and the William and Flora Hewlett Foundation, with both donors providing follow-up grants. At the heart of the TESSA OER bank are sets of practically focused study units designed to directly improve teacher classroom practice; each of the 75 study units contains a series of activities for teachers to carry out with their pupils. These activities centre on clearly defined strategies for teachers to think about and experiment with in their classrooms. Guidance for teacher educators is provided, demonstrating how study units link together, and student progression is supported through each module (collection of 5 study units).

Each study unit has been adapted and versioned to the nine country contexts of participating TESSA institutions, including translation to Arabic, English, French, and Kiswahili. The design of the TESSA web environment is organized to enable each country/institution to have their own web presence, and because of the current challenges in connectivity and access the study units are provided in a range of formats. The template for the TESSA study units together with the design, versioning, and development processes are fully explained in earlier descriptions of our work (Wolfenden, 2008).

Integrating TESSA OERs

The first phase of TESSA focused on design and production of the study units and web space, but considerable resource was also devoted to planning for the use of the study units in each of the 13 partner institutions delivering teacher education in the region. Consortium institutions are engaged in delivery and accreditation of a large number of different types of courses and programmes, pre-service, in-service, on-campus, distance learning, certificate, diploma, and B.Ed., together with non-accredited short professional development courses.

There has been no blueprint for integration of the TESSA OERs into this vast range of programmes and courses; rather, implementation is a dispersed and decentralized process. The TESSA framework takes account of the knowledge and problem-solving abilities that exist within each partner institution (Elmore, 2000). Within the professionally supportive structure of the consortium, each institution is given the freedom to decide on the programme(s) or courses, selection of TESSA OERs, mode of access of OERs, and so on to best meet local needs and context.

TESSA coordinators at each partner institution, who occupy a variety of institutional roles, are important to the change process. Their knowledge of the social structures within which they are operating, the competing agendas, and the relative influence of different layers within their institutions are crucial in understanding the potential effects of the chosen implementation strategy for the TESSA OERs. The delegated discretion accorded to TESSA coordinators in each TESSA partner institution enables them to develop the most direct path for greatest impact on teachers' practices in their context. They provide the connection between the pedagogic frameworks of the TESSA resources and approach and the detail of practice in schools (Elmore, 2000a).

Forms of Integration

Through 2009 over 200,000 teachers are planned to engage with the TESSA OERs across nine countries: Ghana, Kenya, Nigeria, Rwanda, South Africa, Sudan, Tanzania, Uganda, and Zambia. Analysis to date of the form and mode of use of the TESSA OERs in partner institutions suggest that these can be grouped as the following: *highly structured*, *loosely structured*, and *guided use*.

The highly structured model is characterized by production of a ‘guide’ or course book of activities or whole study units drawn directly from the TESSA Resource Bank – a learning journey with TESSA materials. In some cases these TESSA materials are interspersed with other activities, narratives, and exercises. Teacher engagement with issues of particular relevance has been strengthened by the addition of commentaries and prompts for the teacher to consider as they think about enactment in their own classrooms. These books or guides have generally been designed by senior academics for use on distance education courses, where teachers are supported by tutors or supervisors.

Key proponents of this model in the TESSA consortium have been the National Teachers’ Institute (Nigeria) and the Open University of Sudan. Both institutions operate distance education at large-scale; many of their students will be located in rural areas with little chance of access to the Internet or regular support from institution staff. However distribution channels for hard copy materials are well established. At the Open University of Sudan, academics have undertaken a comprehensive mapping exercise with the TESSA materials (in Arabic) against both the teacher-training curriculum and the school pupil curriculum to pull together a book of TESSA study units. This book will be used by all students in the third and final teaching practice of their bachelor’s programme. This year, the cohort numbers 53,000. In Sudan, as in many countries across the world, the pupil curriculum is highly controlled and fixed, but by careful linking of the TESSA activities with the school curriculum, TESSA materials can be used “without alienating head teachers” (Sineda, 2009). The National Commission for Colleges of Education in Nigeria (a federal government body) has created similar books based on TESSA materials, one for each area of the primary curriculum. Each book links 10 classroom activities (drawn from TESSA study units) alongside questions to prompt teacher experimentation and reflection. These books are to be used with all pre-service teachers across Nigeria. In both instances there were previously no resources to support the student teachers’ whilst on teaching practice and the books provide a structure and framework for skills development.

In what we have termed the loosely structured model, lecturers in partner institutions have selected TESSA study units to use in their own courses. This selection, usually at workshops, has involved matching the learning outcomes (typically highly subject knowledge specific) of selected existing modules to the curriculum focus of the TESSA materials. The following table shows an example from a workshop with lecturers at Egerton University in Kenya (October, 2008).

Table 1

Loosely Structured Model: Example from Egerton University Workshop

B. Ed (Primary)	Theme topic	Suggested TESSA module / section	Suggested TESSA activities	Teacher learner outcomes
PECI 111 Introduction to Basic Mathematics Concepts	Exploring 3D Shapes	Module 2 Section 3	<ul style="list-style-type: none"> - Collecting 2 D objects - Sorting the shapes - Naming of these shapes - Real-life applications of these shapes - Identifying and counting vertices, edges and faces. - Construct and fill table for faces, vertices , edges - Make nets 	<p>Consolidation of distinguishing features of 2D and 3D shapes.</p> <p>Increased skills in use of practical activities to investigate and show relationships between 2D and 3D</p>

In this model lecturers have used the selected TESSA resources in a variety of ways: teachers carry out the TESSA activities in schools and report back at the next tutorial or support session; as well, the resources are used in micro-teaching sessions, in face-to-face lectures, and in tutorials.

Examples of this use can be seen on distance education programmes at Egerton University (Kenya), Makerere University and Kyambogo University (Uganda), and the University of Zambia. Course structures here involve punctuation of distance study with relatively long intense face-to-face sessions (typically during the school holidays) and relatively low student numbers. Students are given copies of the individual TESSA study units or are expected to source their own copies from the TESSA web site or from their own institution. Some institutions are beginning to distribute CD-ROMs of the TESSA materials to students. In a variation on this model, colleagues at the Open University of Tanzania are constructing a new diploma course for teachers by drawing heavily on the TESSA materials, which can be seen as a bridge to the more highly structured model.

In the guided use model no pre-selection of TESSA materials is undertaken by university academics; teachers on various courses select (from the TESSA web site) the most appropriate study units for their own needs, devising their own learning pathway through the material. At Our Lady of Apostles Training College (OLA) in Cape Coast, Ghana (working with the University of Cape Coast), the student timetable has been amended and all students have one session per week in the computer labs to browse and study the TESSA materials, choosing activities and resources to use in their assignments, in on-campus micro teaching, and in teaching practice in local schools. Students are also encouraged to contribute to the TESSA forums; the TESSA web site includes a number of forums (online discussion areas). All visitors to the web site can read

messages in the discussion areas but users are required to register in order to post a contribution. A valid email address is required for registration. The implementation of this session at OLA forced students to create email addresses and become familiar with the use of the web.

At the University of Winneba (Ghana) students have formed a TESSA club. They meet weekly in the university campus to discuss TESSA materials and their experiences of using them. Similarly students on B.Ed. courses at the University of Pretoria (South Africa) are required to select TESSA materials to use during their teaching practice and to discuss their experiences during group reflections and in an individual survey at the end of the practicum. Key to the use of this model is access to the TESSA web site by individual teachers; however, experiences at OLA in Ghana have shown that teachers do not need their own individual Internet-enabled devices to become part of the TESSA community because access to shared institutional computers during short but regular timetabled sessions has been effective in introducing teachers to the TESSA materials.

It is becoming clear that a variety of interacting factors are important in determining how OERs are most easily utilised in open and distance education programmes. More detailed reflection below on the TESSA journey at the University of Fort Hare illustrates some of these factors.

TESSA at the University of Fort Hare, South Africa

Fort Hare provides one model of what I believe all the universities responsible for teacher education and training should aspire to. (Moon, 2008, p. 5)

Historically, education in South Africa was central to successive *apartheid* governments' efforts to segregate racial groups and maintain white minority rule. The new democratic government, elected in 1994, was faced with the task of both rebuilding the system and redressing past inequalities. What followed was a plethora of education policies and a consequent dramatic change to both the systemic administration and implementation of education (Lawrence et al., 2006).

Yet although the national Department of Education designed objectives to rectify the imbalances, and they continue to be at the fore, the apartheid legacy remains: "Most currently serving educators received their education and entered teaching when education was an integral part of the Apartheid project" (Department of Education, 2006, p. 6). Since 1994, education in South Africa has followed the top-down approach; numerous policy changes have been conceptualised, planned, and initiated at both national and provincial government levels. Such changes, including the shift to Outcomes Based Education (OBE), have been implemented in very tight timelines and, many commentators argue, with inadequate preparation and resourcing. This poses daunting challenges to both teachers and teacher educators (OECD, 2008).

It is against this context that the University of Fort Hare (UFH) Faculty of Education is tasked with teacher education and development. The university serves an education system that seeks

radically new curricular and pedagogic practices but that works within structures characterised by poor education quality, teachers with poor subject knowledge, a lack of physical resources in schools, poor support for pupils at home, and meagre teacher support (Department of Education, 2006; Newman, 2008; Department of Education, 2008; Moon, 2008; Pandor, speech, March 12, 2009).

Recognising the need for new forms of teacher education and development resources and keen to harness the potential of ICT platforms¹, UFH Faculty of Education became involved with the TESSA initiative from the offset. Much initial involvement in the research, design, and development of TESSA study units was at an individual level, and little information was disseminated to the Faculty. Subsequently, recognising the need for institutional coordination, a dedicated TESSA coordinator was established in the Faculty. This enabled deeper awareness of the TESSA OER development process, and, as a result, a number of academics participated in testing the TESSA web site (navigation and user-friendliness) and coordinated their students, particularly teachers studying part-time, in TESSA study unit development testing in their classrooms. A quarterly newsletter of TESSA OER development progress was distributed to all faculty, staff, and students (www.tessafrica.net). This involvement of academics and students in the development stages of TESSA contributed greatly to the subsequent integration of TESSA OERs.

Following the completion of the South African version of the TESSA OERs at the end of 2007, the UFH and the Open University (UK) co-facilitated a workshop at which academics reviewed modules/programmes and mapped these to the TESSA OERs. A mixture of highly structured, loosely structured, and guided use models of integrating TESSA OERs emerged. Not all colleagues were enthusiastic about the potential of TESSA OERs in their curriculum, citing lack of relevance of the materials and satisfaction with existing provision as reasons for their lack of interest. Such attitudes are not unexpected:

Changing a curriculum is always a difficult and problematic project – one likely to arouse conflict, passion, anxiety and resistance. And this is likely to be the case even where there appear to be overwhelming practical reasons for doing so.
Morrow (2003, p. 4)

In early 2008, the South Africa version of the TESSA OERs was copied onto the UFH server, greatly enhancing their accessibility. This was an important step; Internet connectivity at the time was highly sporadic, particularly during the period of electricity outages instigated by the national electricity provider. Since the end of 2008, this situation, and Internet bandwidth at the institution, has greatly improved.

¹ UFH Faculty of Education's involvement in the DEEP Project exposed the possibilities and potential of ICT in teacher education, even in a province starved of access and connectivity (Leach, 2005)

The flexibility of the TESSA OERs has meant that at UFH the depth and breadth of integration has been determined in response to local context, academic autonomy, and budgetary constraints. As a result, a combination of the forms and modes of use of TESSA OERs has emerged.

Highly Structured: Recognition of Prior Learning (RPL)

TESSA OERs are used as part of the *recognition of prior learning* (RPL) process undertaken by teachers applying to enter the part-time Bachelor of Education programme. Assignments towards the development of their RPL portfolio include, amongst others, adapting TESSA resources to the national curriculum statements, preparing lessons using TESSA activities, delivering the lesson, and then engaging in reflection of the teaching and learning episode. The academic responsible for the RPL process explains that one advantage of TESSA OERs is the integration of the subject content and its presentation in a way that is accessible to many teachers who find it difficult to interpret and select subject knowledge at the appropriate level from text books. The RPL process team also placed a printed version of all the TESSA materials in the library, “in case teachers were not comfortable with using computers.”

Loosely Structured: Teaching and Learning

Rationales for integrating TESSA OERs into academic colleagues’ teaching included exposing students to local examples of case studies and resources, which many text books in use do not provide, and emphasising activities that focus on classroom practice. One academic offered this reflection:

I particularly like the open-ended nature of the activities, and the way everyday materials are used to introduce and embed scientific vocabulary and concepts. Also, most of the activities require the students to get off of their bums. In order to participate, they have to do things, find things, talk about things, and even dance, yes, dance. (Shaw, 2008, p. 2)

Loosely Structured: Assessment

Lack of adaptation of assessment approaches and criteria in curriculum innovation projects can often hinder successful adoption and embedding of the innovation. At UFH, TESSA OERs have begun to be used in formal assessment, thus ensuring a synergy between teachers’ own learning experiences and those suggested in the TESSA approach for classroom use with pupils. In the UFH in-service programmes students were asked to assess a particular TESSA case study, map the TESSA activity to the national curriculum statement for that learning area (in this case science), and determine learning outcomes and assessment standards suitable for a particular grade of learners. As the academic involved in writing the assessment states, “I always aim for the assessment to be a useful learning experience as well.”

Guided Use: Learning Guides

Learning guides are module specific learning facilitation tools that serve as maps for students on various programmes and contain organisational as well as learning facilitation components. Academics have included TESSA OERs as a source of reference in their module learning guides.

TESSA Dissemination beyond the University of Fort Hare

Parallel to the process of integrating TESSA resources within UFH, a concerted effort has been made to share TESSA OERs (predominately the CD-ROM version) outside of UFH, in particular with the District Offices of the Provincial Department of Education (DoE²) and directly to teachers within schools. This has been a challenging exercise. Projects in the pipeline, including links to TESSA from the DoE website, integration of TESSA OERs into the DOE teacher support materials currently in development, and further planned presentations to DoE District Offices and schools, suggest some level of progress being made. However, the continuous political and administrative change in the DoE means that TESSA awareness and dissemination remains an on-going task.

Participation in the TESSA consortium, including involvement in the development and integration of TESSA OERs, has afforded UFH academics and students (both pre-service and in-service) and relevant external stakeholders, such as the DoE, access to communities of practice within the institution, across institutions, and across countries and generated a new discourse of finding, adapting, and sharing educational resources. Though more research needs to be done as to how these communities can be supported (Petrides et al., 2006), TESSA has acted as the constant around which these communities of practice have begun to address important social and educational issues (Moon, 2008).

The interactive coordination of TESSA at UFH, involving workshops, presentations, direct, and indirect communication to both internal and external stakeholders, has generated interested users, and what is becoming apparent is the impact this is having on attracting new users, in particular teacher educators from different institutions in South Africa and beyond. We are deeply encouraged by the interest in the TESSA materials from across the continent, in particular from Namibia, Cameroon, Sierra Leone, Mozambique, Togo, and Niger.

Framing Factors and Next Steps

OERs have the potential to play a pivotal role in democratising access to knowledge in ways that have a special relevance to education systems in developing countries. Recognising the challenges in education, and in particular teacher education, several OER collections and repositories have

² The Eastern Cape Department of Education has 23 education districts. Key district services include advice and coordination on curriculum, education for learners with special needs, and institutional management and governance.

emerged, though very few accounts of how OERs in Africa are being used are yet available (Atkins et al., 2007).

TESSA is a unique African OER initiative, distinguished by its emphasis on and resources devoted to teacher education and by its adaptation of OERs to local contexts and language. We suggest that TESSA OERs offer a considerable contribution towards overcoming the problem of scarce resources in teacher education. Their design as flexible but structured OERs and provision in a variety of formats supports use in teacher education in ways that suit the local context. The design of TESSA has been such that at several levels users (teachers, teacher educators, and academic leaders) are able to participate as collaborators in a network of social relations rather than as solo practitioners; the TESSA forums, workshops, and advisory council meetings provide space for engagement in a network and for conversations with a focus on issues of practice. Communities of practice, at various levels, are beginning to emerge (and continue to evolve), with institutions and individuals contributing more fully to the global arena as producers of knowledge (Smith et al., 2006).

Analysis of the impact of different integration approaches across the member institutions is only at an early stage, but initial analysis of these different forms of integration reinforces our earlier discussion that to fully exploit the potential of OERs they need to be available in a form that is conceptually strong whilst sensitive to local environments to allow for use across different contexts (Wolfenden, 2008). We are beginning to highlight common critical success factors, which frame how the TESSA OERs are being disseminated to colleagues and integrated into teacher education and professional development curriculum:

Access

Issues of web connectivity, bandwidth, availability of peripherals (such as printers), and web skills of users are dynamic tensions and vary greatly from locality to locality. Lack of access to new technology tools restricts users' ability to share adaptations and iteratively improve the resources.

Resource

Whilst OERs are 'free materials' there is a non-trivial cost associated with their use. It has been important not to underestimate the time taken for locating materials, familiarisation, reflection, and in some cases experimentation of how OERs can be integrated into courses and programmes.

Support

Particularly where the TESSA OERs have been integrated into distance education programmes, support models for the use of OERs may need to change. A recent TESSA project in Nigeria and Sudan pointed to the crucial role of supervisor support for teachers. Project teams concluded that regular monitoring, supervision, and reflective activities were critical to teacher development with the TESSA materials. Provision of such support at a scale within budgetary constraints remains a challenge but we are hopeful

that the increasing availability of new communication technologies can be harnessed to reduce costs.

Cultural practices

Institutions' existing practices in terms of the level of direction exercised over curriculum materials and the degree of autonomy of lecturers and students to select material is a crucial factor in the form of integration of the OERs.

Sustainability

What constitutes as sustainable varies from institution to institution and country to country. A variety of funding models, including sponsorship, government, partnerships, and exchanges, are currently being used (Downes, 2007). However, these are only part of a larger picture, one that includes community and partnerships, co-production and sharing, and distributed management and control. At this stage in the TESSA project, a key challenge is maintaining momentum at the consortium level and sourcing funds to support the maintenance and development of the project infrastructure, in addition to inter-institutional as well as local institutional initiative funding. Central to this is the migration of the key administrative functions from the Open University (UK), which has been leading the project in these first phases, to an African site.

As the TESSA experience is beginning to reveal, the possibilities and potential for harnessing OERs in teacher education are immense and offer an innovative platform to support teacher learning, particularly where local educational resources are scarce. TESSA attempts to bring teacher training nearer to the point of delivery – school classrooms. Cost effective implementation of this approach is possible through the use of a core of highly structured study units adapted for local implementation. Though richer assessment of the impact of TESSA OERs in teacher education is in the pipeline, we suggest that the collaborative design and development and subsequent integration of TESSA OERs is supporting institutions in moving from traditional teacher-led methods of teaching to more democratic, learner-centred models.

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Designing to Promote Access, Quality, and Student Support in an Advanced Certificate Programme for Rural Teachers in South Africa

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Abstract

This paper reports on the re-design of the Advanced Certificate in Education (ACE) programme, which is offered by the University of Pretoria through distance education (DE) to teachers in rural South Africa. In 2007, a team re-designed the programme with the goal of promoting access, quality, and student support. The team included an independent body, the South African Institute of Distance Education (SAIDE), and various education specialists. Training workshops for academics and a comprehensive internal and external review process contributed to the quality of the re-designed programme. Interactive web-based technologies were not included because of poor Internet connectivity; however, the authors note the use and potential of cell phone technology for DE programmes. Student support was enhanced by an additional short contact session, a capping assignment, a CD-ROM, and decentralised tutoring at contact venues. The programme was re-evaluated and approved in 2008, and the re-design methodology now guides similar projects.

Keywords: Distance education; programme re-design; teacher education; materials development; electronic support; student engagement; exit level outcomes; learning outcomes; programme evaluation

Advanced Certificate in Education Programme

The University of Pretoria offers three distance education programmes in the Faculty of Education for teachers in rural areas. Due to the lack of access to technology, the primary delivery mode is paper-based learning materials. The Advanced Certificate in Education (ACE) (Education Management) programme underwent a major re-design endeavour for two reasons: to re-conceptualise the programme after five years of implementation in the normal course of continuous improvement as well as to address recommendations made by the national quality assurance agency, the Higher Education Quality Committee (HEQC).

This paper reports on various strategies and methodologies that were adopted to ensure that the newly designed programme would meet not only the requirements of the HEQC but also international standards. The Unit for Distance Education at the University of Pretoria collaborated with the South African Institute of Distance Education (SAIDE), who presented workshops, facilitated the development of programme and module outcomes, and evaluated learning materials as they were being written. The Department for Education Innovation at the university provided services in terms of project management, educational consultation, graphic design, video production, and instructional design of a supplementary CD-ROM.

In a country like South Africa, where a large percentage of formal education takes place in deep rural areas, the up-grading and re-skilling of teachers are a real challenge. Teachers cannot attend universities in urban areas as residential students or take leave and stay away from home and school to attend lectures. An added challenge is that the recent Occupational Specific Dispensation (OSD) document of the Education Labour Relations Council (ELRC) determines that by 2013 all practising teachers must meet the M+4 level to be registered by the South African Council for Educators (SACE).

This requirement puts an extra burden on teachers to obtain at least an ACE qualification within the next five years. In view of the geographical position of many teachers, the only alternative delivery mode for such qualifications is by distance education. The purpose of this case study is to describe the process followed to develop an ACE specialising in Education Management. Various strategies were designed and implemented to produce a world-class qualification of high academic quality. Not only does the re-designed programme meet national needs, it also stimulates personal and professional growth of the teacher corps.

The authors of this paper are the project manager (one fifth of her time was allocated to this task), the full-time manager of the Unit for Distance Education, and the academic coordinator of the ACE programme (see the Team Approach section for a description of our responsibilities).

Student Profile

The ACE (Education Management) programme is targeted at practising teachers, experienced, fairly senior teachers as well as newly qualified or novice teachers. Analysis of the student profile reveals that these adult learners are geographically spread throughout South Africa, with the majority living in deep rural areas and teaching in schools that lack facilities such as functioning classrooms, libraries, and equipment.



Figure 1. Disadvantaged schools in rural areas.

Demographic statistics reveal that all the candidates are in full-time employment as teachers: 70% are women, 61% are older than 40 years, and 90% are second language speakers of English. The proportion of students who have access to the Internet is very small (about 1%). However, the number of students with access to a computer is growing significantly, from 9% in 2005 to 24% (almost one quarter) in 2007. In other words, the target population consists mostly of mature, female teachers, wishing to improve their qualifications, yet hampered by problems of distance, English literacy, and access to technology. Interestingly, almost all of them (99%) have access to cell phones.

The ACE (Education Management) qualification empowers teachers to critically evaluate, develop, and improve self-management, classroom management, and the ability to contribute to the transformation of the school. Therefore candidates must be able to demonstrate applied competence, which includes foundational competence, practical competence, and reflexive competence. This was part of the underpinning philosophy of the re-design endeavour.

Distance Education Model

Distance learning programmes at the University of Pretoria operate within a customised, open, flexible learning academic model. A certificate programme offered by means of distance education consists of six modules (courses¹), which must be completed within two to four years. The programme is sub-divided into three blocks of time (minimum of 6 months per block), with two modules (courses) per block. Students receive their learning materials in a staggered manner; that is, they receive the learning materials for two modules every six months. Students work at their own pace and cannot fail a year, only a module.

The University of Pretoria distance learning model is uniquely flexible in that students can enrol at any time of the year and write exams when they feel that they are sufficiently prepared. The only proviso is that they must finish the programme in the allotted maximum time by submitting two formative assessments and passing a summative assessment in each module. This provides students with unprecedented levels of flexibility and enables them to remain in the programme even when circumstances force them to cease studying for a while.

¹ In this paper the terms ‘course’ and ‘module’ are used synonymously.

Research Questions

The following research questions guided the design and development process:

- What strategies should be used for the re-design and re-development of an existing advanced certificate distance education programme in order to promote access, quality, and student support?
- What processes should be followed in the re-design and re-development of the programme?
- What training is required to equip academic staff members to re-conceptualise their teaching and assessment strategies and to write effective learning materials?
- How can ICTs be incorporated in the re-designed programme to provide additional enrichment materials and electronic support to rural students?

Basically in reconceptualising a learning programme, one needs to consider the purpose of the programme, the structure of the programme, the articulation between modules in the programme, the learning activities, the support materials, and the assessment strategy. The South African Qualifications Authority (SAQA) provides the following diagram, which synthesizes all the concepts that should be addressed in the design of a learning programme.

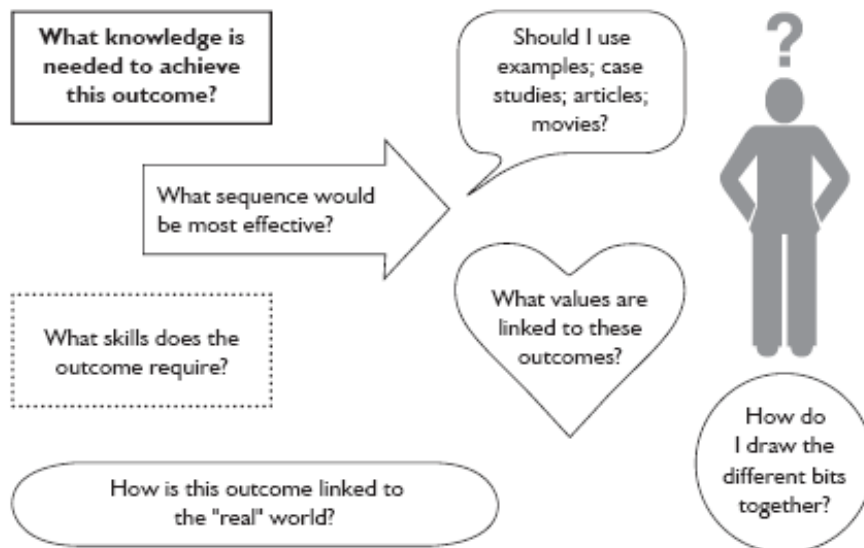


Figure 2. Designing a learning programme (Source: SAQA, 2005, p.4).

Figure 2 shows an informal and helpful synthesis of the kinds of questions an educator needs to consider in designing a learning programme: What do students need to know, do, and learn, and how may we design a learning pathway to assist them in achieving the required knowledge, skills, values, and outcomes?

Educational Approach

The University of Pretoria is a contact institution. Hence lecturers are not trained in writing distance learning materials that are designed to promote learning for students at a distance. Furthermore, due to the lack of student access to the Internet, it was not feasible to consider online facilitation, interaction, and communication. It was necessary to engage the lecturers in thinking about how to promote student learning by means of paper-based distance education and limited contact sessions.

A paradigm shift was required, from the content transmission approach to a more reflective, Socratic approach. The authors of the materials (the lecturers) needed to realise that in the face-to-face situation, it is easy for the lecturer to ‘get a feel’ for whether the students are engaged, to respond to their questions immediately, and to guide and structure the lecture in a way that addresses their needs at particular moments. As far back as 1990, Beaudoin (1990) pointed to a dramatic evolution in the roles of lecturers in terms of how to contribute to the teaching and learning process of independent, distributed students – a process which involves learning rather than teaching. In distance education in particular the writer needs to anticipate what a learner is likely to think or do. One of the key mechanisms to achieve this process of anticipation and reflection is to construct meaningful and relevant learning activities to guide the learner along a learning pathway (Moll & Drew, 2008). Learners need to be invited to reflect on what they have read and on their own experiences, to discuss issues with their colleagues and peers, to practice certain skills, and to consult resource materials for further information and practice (Smythe & Witthaus, 1998).

The aim was to produce a comprehensive yet coherent curriculum. One of the recommendations of the HEQC was that the content, activities, and assessment should be integrated across the entire programme. This required another paradigm shift – for the module writers to be more in touch with each other, and to work together throughout the process. The dilemma was to ensure that the modules ‘speak to’ each other and build upon each other, without unnecessary repetition. It was not easy to solve this dilemma in an elegant way. The best that the management team could do was to encourage the module coordinators and writers to meet regularly, to review each others’ materials instead of writing in isolation, and to seek instances where cross referencing between modules was meaningful.

Methodology

This section presents the research design, the improvement plan, the methods adopted (team approach and workshops), and the process that was followed.

Research Design

It was decided to adopt the “Design Down → Deliver Up” methodology (SAQA, 2005), which was conceptualised by SAQA as a step-by-step approach to developing learning programmes

based on outcomes. Figure 3 illustrates the methodology, which can be applied both at the level of a programme (exit level outcomes) and a course (specific learning outcomes). The methodology was developed in order to meet the need of “providers [who] are faced with the responsibility of planning the learning and assessment processes that support the achievement of outcomes and enable the quality assurance of such achievement” (SAQA, 2005, p. 1). A learning programme is defined as the “learning and assessment activities derived from the outcomes that make up a qualification. This is what the provider designs, based on sound educational principles (for example, learner centeredness)” (SAQA, 2005, p.1).

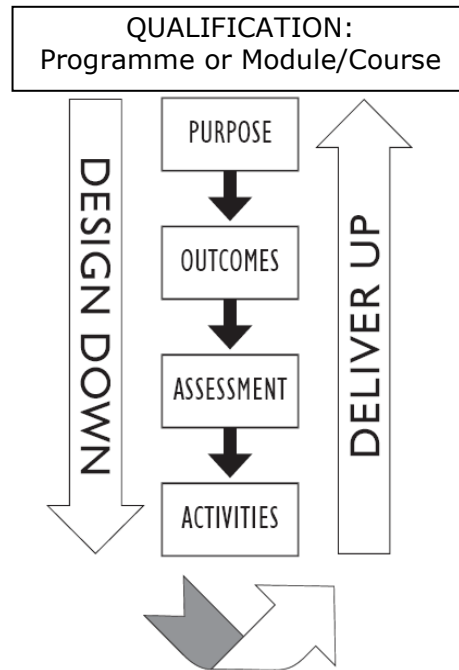


Figure 3. The “Design Down → Deliver Up” approach (Source: Adapted from SAQA, 2005, p.6)

Starting from defining the purpose of the learning programme, the methodology moves down to specify how the purpose can be achieved, or, in other words, what learning outcomes will need to be achieved, including knowledge, skills, attitudes, and values. The next step is to design an assessment strategy in order to be able to know if the students have achieved the outcomes. However, we cannot simply make learning material available to students and expect them to be ready for assessment; we need to plan and design learning activities to guide students along the learning pathway and to prepare them for the assessment.

Once the design down process is complete, you will ‘deliver up’, that is, conduct learning activities which will prepare your students for the assessment activities. These in turn will provide evidence that they have met the outcomes and thereby achieved the purpose of the qualification. (SAQA, 2005, p. 6)

Improvement Plan

Two broad key priorities were identified, which formed the basis of the improvement plan:

- re-design of the learning programme, i.e., purpose, educational approach, assessment strategy, materials development;
- improvement of academic student support, i.e., support systems to facilitate and enhance the learning of students.

The particular components shown in Figure 4 are discussed below the figure.

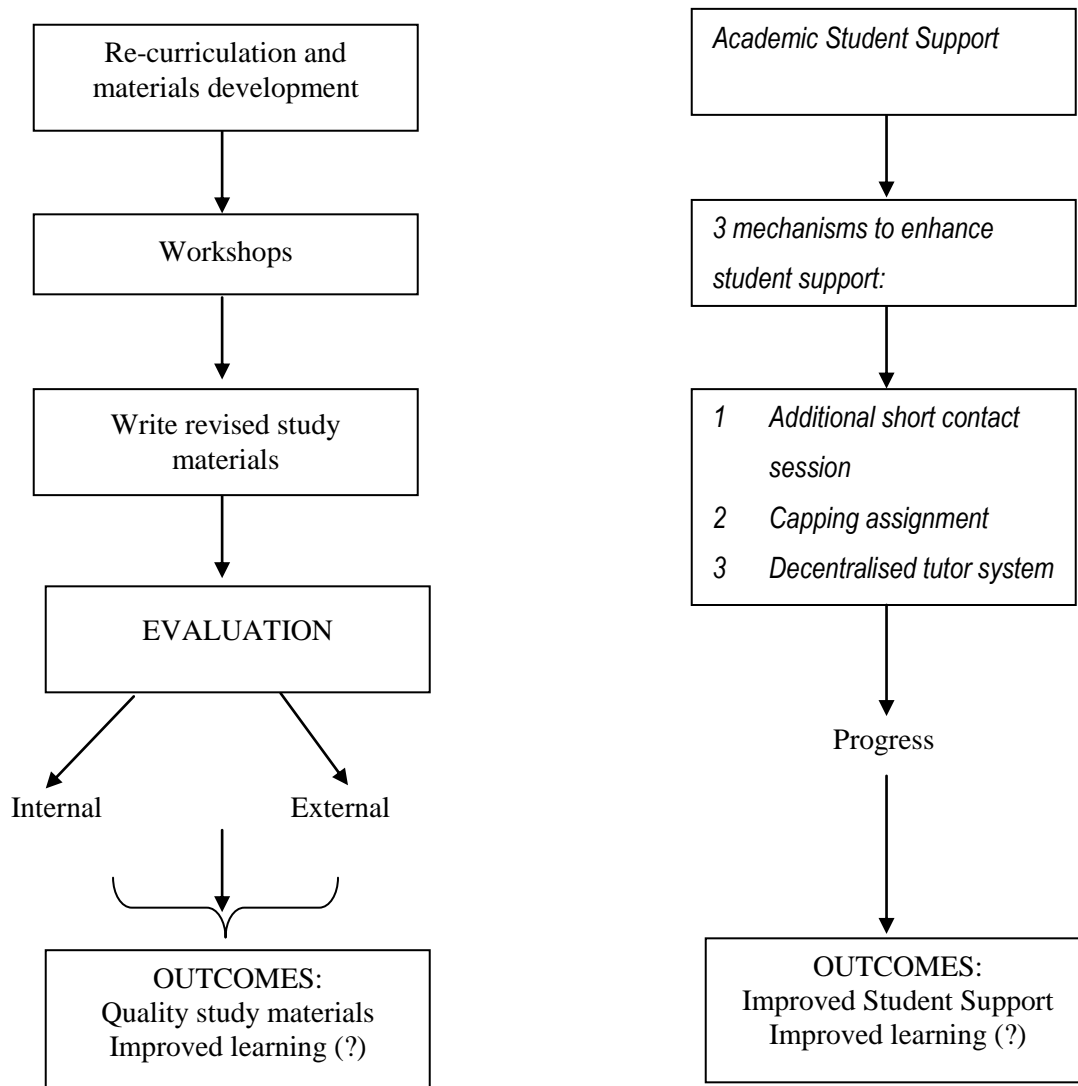


Figure 4. Improvement plan for the re-design of the Advanced Certificate in Education (ACE) programme (Source: Van der Bank, 2008).

These main priority areas of improvement entailed the following issues:

- revisiting the academic cycle;
- reviewing and clarifying the underpinning theory of the programme;
- reviewing roles and responsibilities of the academic staff (programme and module coordinators);
- additional resources to enhance student learning in the form of a CD-ROM and access to UP library resources;
- additional academic student support in the form of an extra short contact session (2 days) and a capping assignment; and
- a decentralised tutor system to facilitate student learning.

The main priorities of the re-design exercise were fundamental issues such as the theoretical underpinning and the purpose of the programme.

Team Approach

From the beginning it was decided to contract the South African Institute for Distance Education (SAIDE), a non-governmental organisation, to facilitate the process, to ensure that national policies and requirements were adhered to, and to assure the quality of the programme design and the learning materials.

A team approach was adopted in order to ensure that sufficient experts and resources were allocated to the project. The team consisted of the following specialists:

- *Manager*: Unit for Distance Education, Faculty of Education, Overall responsibility for management, coordination, and administration of distance education programmes;
- *Academic coordinator*: Distance education programmes, Faculty of Education, Responsible for the quality of the academic content and standard of the programmes;
- *Distance education consultant*: South African Institute for Distance Education (SAIDE), A consultant in distance education and the design and development of programmes and learning material, bearing in mind national legislation, and a reviewer of learning materials;
- *Project manager*: Department for Education Innovation (support department), Overall coordinator of the production and evaluation of learning materials, managing the timeline and deliverables, reviewing learning materials and producing progress reports;
- *Programme coordinator*: Department of Education Management (academic department), Coordinator of the process followed by module writers and co-writers, reviewer of learning materials, and point of contact for all role players;
- *Authors and co-writers per module*: Department of Education Management, Subject matter experts who wrote the learning guides, provided reading lists for the CD-ROM, and facilitated contact sessions;

- *Education specialist*: Department for Education Innovation (support department), Pedagogical expert who reviewed materials in terms of alignment of learning outcomes and activities and implementation of the workshop outputs;
- *Language editor* (external contractor)
English language editing to ensure consistency and accuracy of learning guides and tutorial letters;
- *Library information specialist*: Department of Library Services,
Procurement of copyright permission and building e-library pages in HTML for the CD-ROM;
- *Instructional designer, graphic artist, photographer, video producer*: Department for Education Innovation,
Design and development of the visual and audio material on the CD-ROM, icons used in learning guides, art work for learning guides, CD-ROM, and marketing materials;
- *Desktop publishing (DTP) expert*,
Professional layout of paper-based learning guides;
- *Printers*,
Printing and production of paper-based learning guides and tutorial letter booklets.

Further support personnel are engaged, as necessary, in the normal course of the programme, such as academic supporters, facilitators of contact sessions, tutors and markers, but these role players were not involved directly in the re-design process.

Workshops

The first issue that urgently needed attention before study materials could be re-designed was the underpinning theory, which is fundamental to this programme. This is closely linked to the purpose of the programme as well as the target group for whom the programme was to be developed. SAIDE facilitated three inter-related workshops, all of which were based on the Design Down → Deliver Up approach. The workshops took place during April and May 2007 and were structured as follows: workshop 1 focused on the overall programme design including the academic cycle; workshop 2 focused on programme specific curriculum design, concentrating on the relationship between content, outcomes, and assessment strategy; workshop 3 focused on capacity building in terms of materials development.

SAIDE accepted responsibility for the following three aspects:

- working in close cooperation with the programme coordinator and module coordinators on the curriculum and learning design for the six ACE (EM) modules;
- working with the Department for Education Innovation to develop a template for the writing and preparation of the study materials;
- keeping standards and quality of the materials on a high level and alerting the university in a timely manner if this was not the case.

The workshops produced useful outputs. At the programme level, the structure of the programme was formulated, together with its purpose and the desired exit level outcomes. It was clearly indicated how individual modules address the exit level outcomes and integrate with each other. At the module level, outlines were developed for each of the six modules according to a template, which describes the purpose of the module, links with other modules, learning outcomes, key assessment tasks, and associated assessment criteria for each unit within a module. The third output from the workshops was the beginning of a programme overview document, which evolved as writers prepared materials and was refined into a useful guide provided to all new students entering the programme.

Process of Materials Writing

The process was a complex one, considering all the team members involved and the extent of the peer and expert evaluation that was agreed upon (see *Evaluation*). In order to ensure that the writing of materials did not proceed too far without peer evaluation, it was decided to divide the materials development process into three phases:

- phase 1 - produce the introduction to the module and write materials and activities for unit 1;
- phase 2 - complete writing of materials and activities for the first half of the module;
- phase 3 - complete writing of materials and activities for the rest of the module.

After the workshops, and working from their module outlines, each author and their co-writers began writing their learning guide² and compiling a list of required readings for their Reader³ (if required). The due dates for phases 1, 2, and 3 were mid-June, mid-July, and mid-August, 2007, respectively. On completion of each phase, the material was internally evaluated and then evaluated by SAIDE (see Evaluation section). After phase three, each complete module was evaluated internally, externally by SAIDE, and then by two critical readers in the field. Language editing was also carried out after the completion of each learning guide.

The implication of this process, so closely interwoven with evaluation, was that after each phase, the materials with comments were returned to the authors (lecturers) for their attention. This was a significant burden for lecturers who had to deal with responding to the comments and queries over and above their usual workload and sometimes in a time span as short as one weekend. The challenge was addressed by forewarning the lecturers in plenty of time and sharing with them the process flowcharts so that they understood the complexity of the demands and time pressures placed on all role players. Fortunately they appreciated the strategic importance of the curriculum re-design project since the academic programme had been discontinued by the HEQC until the

² The term ‘learning guide’ was agreed upon, as opposed to ‘study guide’, ‘learning manual’, ‘study manual’ or similar.

³ It was decided not to use any prescribed text books, but to provide additional content in the form of a paper-based reader, if required. This was the case in three of the six modules. The remaining modules presented all the required material in the learning guide.

newly designed programme became available. Most lecturers were able to meet the tight deadlines, even if it meant contracting part-time secretarial help. A saving grace was that other service providers, such as the language editor and the printing house, could not cope with all six modules at once, so delivery times could be staggered. The process was managed from the project management point of view by means of tables, schedules, and flowcharts built in MS Excel.

Evaluation: Internal, External, National, and International

Credible and rigorous review mechanisms are critical in order to ensure the quality of programme design as a whole, as well as learning materials. Woodley and Kirkwood (1998) confirm that, “The primary aim of evaluating instruction is to improve the quality and effectiveness of the teaching and learning involved ... there is the potential to improve not only individual teaching materials, but also the overall course of instruction” (p. 291). Informal, formative evaluation may be conducted by asking colleagues or education experts to peer review learning materials. External critical readers who are experts in the subject area may be commissioned to formally review and comment on draft materials (Woodley & Kirkwood, 1998).

In this case study, internal, external, national, and international review arrangements were made, as discussed below. Figure 5 summarises the role players who were involved in reviewing the programme and the materials at the course level. An evaluation checklist was drawn up, based on nationally accepted quality criteria (Welsh & Reed, 2005). The checklist was used by the internal reviewers and the critical readers.

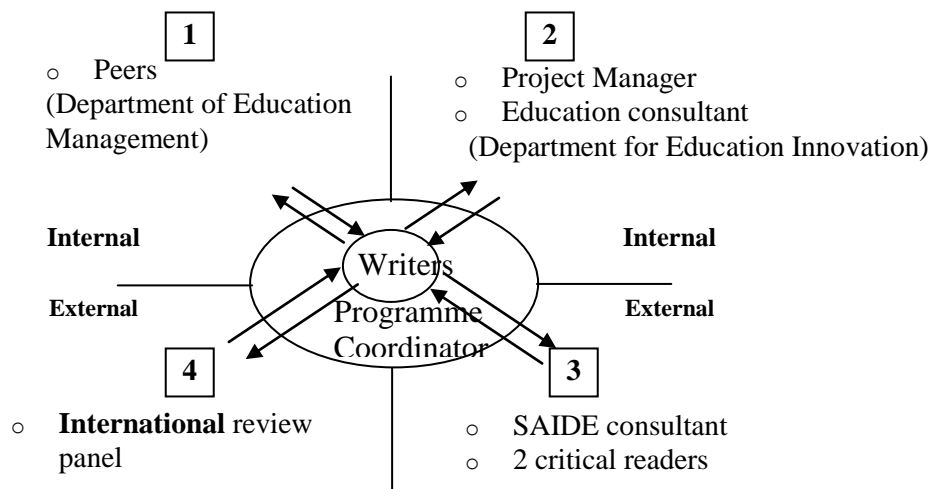


Figure 5. Evaluators involved in assuring the quality of the programme and the learning materials

After each stage of the evaluation process, the materials were returned to the writers in order to address the comments and changes suggested by the reviewers, which resulted in a cyclical, iterative process of continuous improvement. The timeline was planned such that for all six modules, the internal reviews (stages 1 and 2 in Figure 5) took one, two, and three weeks respectively for phase 1 (introduction and unit 1), phase 2 (first half of the units), and phase 3 (the

complete modules). The external SAIDE consultant (stage 3 in Figure 5) similarly took one, two, and three weeks respectively to evaluate modules in phases 1, 2, and 3, which took the project to early October 2007. An array of suitably qualified critical readers had been previously identified and contracted. They were each given 10 days to evaluate one module and write their report.

The language editing activity caused a delay, since one highly recommended language editor had been contracted to edit six modules, for which she required six weeks. By early December 2007, the entire programme was ready to go to the international review panel, which produced a report by mid-January 2008. Due to the rigorous nature of the review cycle, the extent of edits required by the international panel was minimal. The materials then went for desktop publishing and printing during February and were ready for despatch to students in March 2008. The entire exercise, from initial workshops to a set of quality assured learning materials, had taken exactly one calendar year.

Internal Reviews

An internal review and evaluation process on the completed study material was followed to ensure that the content was relevant and that the standard and language register of the materials met the required criteria. The internal reviews were conducted by the programme coordinator, the project manager, and the education consultant. The authors had to make changes and address comments before the next step in the review process started.

External National Review

Two critical readers were appointed for each module. Each of the critical readers received a checklist according to which the study material should be reviewed based on the accepted assessment criteria. The reports of the critical readers were studied carefully and the necessary recommended changes were made by the authors.

External International Review

In order to ensure that the programme not only met national standards and requirements but would also meet international requirements, the programme (all modules and additional information) was submitted to an international team of reviewers, coordinated by a well-known international expert on distance education study materials and delivery modes. The international panel produced a report in which the programme was commended and the University was congratulated on the quality thereof.

Use of ICTs

The University of Pretoria firmly believes that, to be in the forefront of knowledge creation, management, and dissemination, high quality, efficient educational provision should encompass the optimal use of technology. Innovation and flexibility within a learning environment should not only be permitted but encouraged.

CD-ROM

Rich environments are known to engage students in terms of active learning and authentic contexts (Grabinger & Dunlop, 1995). Attention was given to the importance of real-life learning activities as well as the need for a more resource-rich environment, which had been identified by the HEQC. A “push technology” approach was adopted, notwithstanding the knowledge that only a quarter of the students have access to computers. The intention of this strategy is to encourage students to try to get access to a computer, either at the schools where they work or at an Internet café. Other development initiatives in the country, such as the Digital Doorway project (Meraka Institute, n.d.), are involved in bringing computer facilities to rural areas.

A CD-ROM was developed for the ACE students in order to provide additional electronic supporting resources. The team was careful to ensure that the CD-ROM contains enrichment learning materials and not compulsory reading, so the majority of students, who do not have access to computers, are not disadvantaged in any way. The optional extra materials on the CD-ROM include an “e-library” (library articles), generic academic support (e.g. study skills, time management, coping with stress, etc.), video clips to demonstrate the completion of administrative documentation, and a photo gallery of the campus of the University.

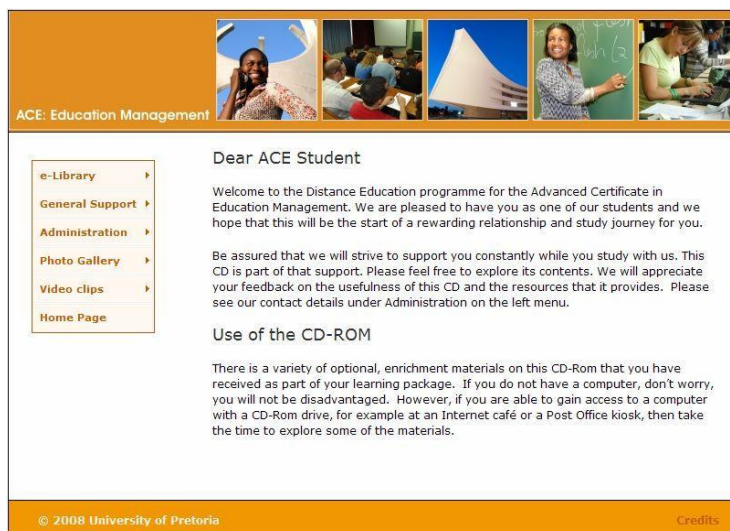


Figure 6. Home page of the supporting CD-ROM.

Microsoft Word Template

SAIDE suggested the development of a Microsoft Word template for authors to use in order to yield greater alignment in terms of layout, fonts, heading styles, etc. The Department for Education Innovation built such a template and trained the lecturers how to use it in a two-hour hands-on computer session. Guidelines were provided in the form of Guidelines for Writers (house style, use of language, referencing style etc.) as well as Technical Guidelines (MS Word technicalities such as generating an automatic table of contents, the use of electronic comments, page layout, etc.).

Although all the lecturers used the template, they did so with varying degrees of success, due to their varying levels of computer skills and experience. It appeared that their thinking about the content was not constrained by the use of the template; indeed, it prompted them to try to make the materials more interactive by using activities and feedback, instead of lapsing into a transmission approach. The outcome was that it saved considerable time in the final stages of formatting the learning guides and was certainly preferable to working without any sort of formatting structure.

Cell Phone Technology

Cell phone technology (m-learning) is utilised to support distance education students. Although only 1-2% of distance education students have regular access to an Internet-enabled computer, more than 99% of them have cell phones. The university is committed to making use of bulk SMSs (text messages) to communicate important administrative issues to students as well as to use m-learning (mobile learning supported by cell phone technology) for academic purposes. Five types of SMS interactions are used to support distance students: academic instructional messages to students, interactive quiz questions with feedback provided, submission from students of answers to paper-based quizzes, academically relevant questions from students, and 30-second mini lectures on important concepts. The valuable opportunities provided by mobile learning in this unique context and how they are being used for this target population are the subject of a different article (Hendrikz & Prins, 2009).

Student Support Mechanisms

One of the priorities of the improvement plan (see Figure 4) was to develop and implement strategies to improve and enhance academic student support and student learning. UP distance education students may attend various centres around the country for face-to-face contact sessions with full-time academic staff as well as with specially employed, trained, and monitored tutors. A well-defined research project, headed by a permanent researcher, has since been established to investigate the effectiveness of all the student support mechanisms described below.

Additional Short Contact Session

In the past, students attended a “long” contact session (4 days) every six months, which was well into the semester. This project introduced an additional “short” contact session (1 day) at the beginning of the programme. The purpose of this additional contact session is threefold:

- student orientation and comprehensive clarification of all administrative issues;
- introduction to generic academic issues to prepare the student for his/her study and learning journey, including issues such as study methods, how to analyse and answer questions, critical reflection skills, academic writing (how to develop an argument);
- orientation for modules in the different blocks – what is expected from the student.

Feedback from students after the session held in April 2008 was positive and will contribute to determining the effectiveness of such an orientation contact session to promote the success of students who have not studied for a long period of time.

Capping Assignment

The capping assignment is an integrated assessment exercise to be submitted after all the modules have been passed. The purpose of this overall assignment is to ensure that students are able to integrate what they have learnt in all the modules in the programme. It is designed to help them to apply this integrated knowledge in the practical school situation and to think holistically in order to be successful in their teaching practice. This assignment will also help the design team to determine the impact of the programme, i.e., whether the programme overall is achieving its purpose. The first submission of the capping assignment will take place later in 2008. The evaluation of its effectiveness provides scope for further research.

Decentralised Tutor System

This system is an effort to assist students in their learning process by means of regular tutorials where appointed tutors facilitate sessions with students. Tutors at the 15 contact session venues have been trained on techniques in facilitating learning. The tutorial sessions were quality assured by a team of quality assessors (mainly module coordinators and academic supporters). Two of the four annual tutorial sessions have taken place so far. Feedback from students as well as from the tutors has been positive. Feedback is utilised to improve the tutorial sessions and in particular the learning facilitation process.

Challenges and Lessons Learnt

In pursuing various strategies and methods to adopt in the re-design of the ACE (Education Management) certificate, a number of challenges were encountered and lessons were learnt. The majority of challenges were well-known and concerned the characteristics of the student population: they live in rural areas, they cannot afford to take time off work to attend regular

classes, and they lack access to Internet technology. The entire academic model of the Unit for Distance Education has been sensitive to these constraints since its inception in 2002. Clearly in the circumstances, all required learning materials had to be produced in paper format and mailed to the students, and online Internet-based learning was inappropriate. In order to introduce some enrichment in the form of electronic support, the CD-ROM provided an optional e-library and academic support materials for the growing number of students who at least have some form of access to a stand-alone computer. A unique opportunity presented itself in the prevalence of mobile phone ownership, which has been exploited in innovative ways including administrative message and academic support to remote students (Hendrikz & Prins, 2009).

A valuable lesson that we learnt was to involve the independent body, the South African Institute of Distance Education (SAIDE), in the entire re-design and materials development exercise in order to ensure that the redesigned programme meets the standards of national quality assurance bodies. Further, the use of independent critical readers in the field and an international review panel ensured that the programme meets recognised national and international academic standards.

The cost implications of the re-design effort were significant, not least the replacement of the entire package of learning materials that were still in circulation (over 5,000 enrolled students). The cost of producing 7,000 CD-ROMs amounted to ZAR 85,000, while the fees to SAIDE, the critical readers, and the international review panel were also significant. Fortunately the Unit for Distance Education is in a position to carry such costs, due in large part to the significant income that distance education students contribute to the university.

In any curriculum re-design attempt, the implications in terms of human resource demands should not be underestimated. In this case study, it was a wise decision to commission sufficient team members to provide required support in the form of project management, educational consultation, graphic design, language editing, and design and development of learning materials. Another challenge was the vagaries of the academic environment, implying that academic staff members value their independence and are unused to enforced deadlines such as might be commonplace in a commercially critical endeavour. The project team had to be sensitive to the demands on academic colleagues and flexible in circumventing delays even if this meant going beyond the call of duty, such as collecting materials from lecturers and delivering them to printers after normal office hours. Nevertheless, the load on the lecturers and their co-writers was significant, not only in terms of designing and developing the learning materials in their subject area but also in getting to grips with technical layout and formatting requirements. Even though they realised the strategic and moral importance of the curriculum re-design project, there was some resistance and some delayed deliverables. In future, incentives for lecturers are recommended, such as time off from regular duties, secretarial assistance, and perhaps even funding to attend distance education conferences, or to buy technology such as laptop computers and mobile devices for learning.

The re-design exercise took an entire calendar year, which was longer than what had been hoped. As delays were encountered, milestones along the timeline had to be adjusted and service

providers further along the timeline (such as language editor, printers etc.) had to be forewarned as to the shrinking time available. Fortunately this strategy, as well as the willingness of all concerned to produce under pressure, meant that the newly-designed programme was ready for students by April 2008.

Conclusion

The value of mapping learning outcomes to module content is confirmed by Ganor (quoted by Holmberg, 2005): “Specification of course content and its instructional objectives in ‘course maps’ serve as a basis for preparing a teaching syllabus” (p. 125). In this curriculum re-design project, the value of the various mapping exercises and mapping documents was that the silo nature which had characterised the previous programme (both across and within modules) was successfully demolished. This had been a strong recommendation by the Higher Education Quality Committee (HEQC) when they evaluated the previous programme.

In reflecting on the answers to the initial research questions, the team came to the conclusion that the methodology adopted had been successful in addressing not only the recommendations of the HEQC but also the moral imperative of providing a world-class distance education programme for rural teachers. The first two questions about strategies and processes for the re-design and re-development of an existing advanced certificate were answered by the Design Down → Deliver Up methodology (SAQA, 2005) that was adopted. The preparatory workshops and the cyclical nature of the comprehensive internal and external review process have informed and will continue to inform similar curriculum design projects at the University of Pretoria and conceivably at other institutions.

The third research question was about the level of training required to equip academic staff members not trained specifically in the field of distance education to adapt their teaching strategies and to write effective distance education learning materials. In this regard, the workshops facilitated by the South African Institute of Distance Education (SAIDE) and their involvement in the first stage of external review of the materials were invaluable. The professional development opportunity for academic staff members has carried over into their thinking about their contact programmes, their learning outcomes and learning activities, and their assessment strategies.

The fourth research question investigated how information and communication technologies (ICTs) might be incorporated in a distance education programme to provide additional enrichment materials and electronic support to rural students. Due to the particular challenge of the lack of access to the Internet, it was clear from the start that interactive web-based technologies were not applicable. The 25% of students who do have access to computers meant that they could at least access optional enrichment materials on a CD-ROM, without disadvantaging the majority. In this way, the CD-ROM has encouraged more students to seek computer access, but it is too early to evaluate its effect on learning. A unique opportunity exists in terms of the use of mobile phones for both administrative and academic interaction with students, which is presented elsewhere (Hendrikz & Prins, 2009).

The team of academics, co-writers, internal and external evaluators, project manager, and Distance Education manager emerged from the experience convinced that the effort and time commitment had been worth it. The newly designed Advanced Certificate (Education Management) programme was re-evaluated by the HEQC team in February 2008 and was approved without question. The same methodology has since been implemented with a different team of academics to re-design the curricula and learning materials for the other two distance education programmes offered to rural teachers.

The new student support mechanisms, such as additional short contact session, CD-ROM, and tutorial sessions, are still in the process of implementation and evaluation. Comprehensive feedback processes and various action research projects are in place to determine the success and effectiveness of these support mechanisms, which will provide the basis for future studies.

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Policy Deficit in Distance Education: A Transactional Distance

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Abstract

This paper innovatively extends the application of transactional distance theory (TDT) to evidence-based policy development in Mauritius. In-depth interview data on student persistence from a range of stakeholders is used to understand the implications of distance education (DE) policy deficit. Policy deficit has surfaced as another dimension of transactional distance and student persistence as an appropriate measuring instrument. Transactional distance is salient in the non-alignment of national and institutional DE planning. Associated results are myopic institutional vision, stagnating national plans, poor resource deployment, and ill-understood opportunities for personal development. This research validates TDT as an instrument for policy development and concludes that supporting advocacy plans will help to achieve sustainable distance education in the region. Lessons from the field in Mauritius can be usefully adapted to the sub-Saharan African context (SSA). These preliminary indications require further research and discussion.

Distance Education Policy Deficit

This article argues that policy deficit in distance education (DE) results in a space for potential misunderstanding and ill-perceptions (Moore & Kearsley, 1996, p. 200). At a national level, this may represent a lack of dynamism in the increasingly technology-driven educational sector and carry a centripetal rather than centrifugal motion in terms of development. Development is hereby understood as an unfolding of opportunities related to human and environmental potential that generally improves meaningfulness and quality of life. At an individual level, this may imply difficulties to access ranges of choice and opportunities. In DE terms, a policy deficit constitutes a *transactional distance* (Moore, 1993) and appropriate procedures must be devised in order to overcome this distance. The broad framework that acts as a matrix for the development and articulation of more specific ones is necessarily a national policy.

A national policy may be seen as a roadmap that establishes the vision of a government and its people. It draws on national resources, contributes to a better understanding of concepts that are related to national concerns, organizes more effective and efficient practice, and plans for positive

changes (e.g., improving rather than increasing access, decreasing costs, attracting investors, enhancing public confidence at local and international levels, and so forth). “Policy typically speaks to context, resources, activities, and desired outcomes” (Pacey & Keough, 2003, p. 402). Policy helps to identify the appropriateness of the types of provision in specific contexts/cultures (Beaudoin, 2007). Development areas include program development, staff training, advocacy for stakeholders (including policy makers), market research, decisions about the appropriateness of available distance education, provisos for accompanying ICT legal frameworks, and funding lobbied for and provided in national budgets, among others. To guide its effective growth there is increased emphasis on the need for DE policies (Simonson & Bauck, 2003), and the lack thereof implies barriers to people’s participation in personal and national development activities. For optimal effectiveness of its operationalization, a national policy should reflect a nation’s vision, should be the matrix within which institutional policy is developed, and should be implementable and demonstrably progressive (Honig, 2006).

Documentary evidence indicates that with the exception of a Lushophone country, Mozambique (SARDEC, 2005), there is no dedicated national DE policy in Anglophone and Francophone sub-Saharan Africa (SSA) in general. A range of DE institutional policy development based on general educational policy documents reveals DE provision and processes that are ill-delineated, despite the proliferation of DE activity in many of the countries (for instance, Botswana, South Africa, Namibia, and Mauritius, to name a few). Generally this research allowed the following points with regards to situations of national policy deficit to surface: (1) Despite the proliferation of institutional DE activities, institutional directions can conflict with national objectives; (2) Institutional development is limited without dedicated resources; (3) With transactional distance taken as a space for potential misunderstanding (Moore & Kearsley, 1996), policy deficit contributes to ill-perceived and ill-understood national, personal, and institutional development requirements; and (4) Student persistence is suggested as an appropriate mechanism to gather intelligence for policy development because it connects supply-side and demand-side variables.

Data was obtained from the University of Mauritius DE participants through one-to-one interviews with students and with stakeholders (other than students). The limited numbers that were interviewed (students, $N = 20$ and stakeholders, $N = 10$), based on a convenience sampling approach, yielded results that are only indicative and not generalizable. However, the research process gave enough information for the construction of a policy development template that, with its potential for contextual/cultural sensitivities, could be applied to most SSA countries.

Policy Deficit: A Dimension of Transactional Distance

Based on the assumption that DE is a layered notion (Sauvé, 1993; Moore & Kearsley, 1996, 2005), policy deficit is hereby taken as an additional layer of transactional distance when there is no agreed-upon charter on DE development, resulting in a limited range of available opportunities. Kinyanjui (1998) argues that aligned with national development plans, DE policies should promote, encourage, and support the orderly development of DE as well as associated technologies, infrastructure, and capacity building. Additionally, policies should help to enhance the effectiveness and management of DE at minimal economic and social costs. Pacey and

Keough (2003) go on to suggest that the following areas should be considered when developing DE policy: academic, fiscal, geographic, governance, faculty, legal, student, technical, technological, and finally philosophical. Non-consideration of any one of these will usher in transactional distance.

Highlighting the importance of the specific context and national development parameters, Kaufman and Watkins (2003, p. 507) argue that institutional goals should be based on an understanding of the potential student market, and they should be aligned with the goals of the given society in which the institution operates. In addition, Lezburg (2003) and Sherry (2003) draw attention to the importance of accreditation and quality assurance issues that should inform a DE policy framework. This is even more significant if qualifications are required to be portable across nations. The appropriate mechanisms to distill such understanding into evidence-based, implementable, and demonstrable policy development (Honig, 2006, p.1) have to be devised and consensually agreed to.

Unfortunately, the absence or scant presence of such mechanisms in policy documents compounds the difficulty of accessing field information (Leary & Berge, 2006) and eventual evidence-based interventions. DE policy deficit is more noticeable in SSA where many policy documents (e.g., White Papers 3 and 4 of South Africa and Education Master Plan for Mauritius) promote its access-oriented importance but do not delineate how to implement and achieve progress through DE. This is now discussed.

DE Policy Deficit in Sub-Saharan Africa

SSA includes a mix of Anglophone, Francophone and Lushophone countries, which are actively engaged in DE provision (ADEA/WGDEOL, 2003a; Gokool-Ramdoe, 2006; Wallet et al., 2007). Leary and Berge argue that Africa's heterogeneity leads to fragmented and uncoordinated DE provision (2007, p.136). Indeed policy and other documents surveyed indicate a complete absence of implementation processes, leaving this to institutional discretion. With institutional interests involved (whereby attracting public funding depends on the index of enrolment (Tresman, 2002; Inan et al., 2006), national interests of quality education may be compromised. A broad survey of the literature (ADEA/WGDEOL, 2003a & b; Wallet & Guidon, 2007; Ambe-Uva, 2007; Siaciwena & Lubinda, 2008; Gulati, 2008) indicates that despite the avowed interest of many countries of the SSA in DE and a proliferation of institutional activities and institutional policy, countries like Botswana (Youngman, 2002; BFTU, 2007; Nhundu & Kamau, undated; Braimo & Lekoko, 2005; Bopelo, 2006; Sardec, 2005) and South Africa (ADEA/WGDEOL, 2003a; 2004; SAIDE, 2004; Badat, 2005; McKay, 2008) have no dedicated national policy that ensures representation of all interests. Policy-based transactional distance is however a relative concept.

Gulati highlights how ill-informed or non-existent DE policy in developing countries, including SSA, contributed to a number of problems, such as a diversion of resources from educational and technological infrastructures and teacher training as well as negative attitudes toward distance learning and social and cultural restrictions imposed on girls and women (Gulati, 2008, p.12).

Policy deficits appear to have a snowball effect, one deficit compounding the implications of the other. For instance, if it is agreed that adult education would best be carried out through DE methodologies, a policy deficit situation in either or both will compromise the implementation of this agreement. Ambe-Uva (2007) demonstrates how the combined absence of an HIV/AIDS policy and a national DE policy in Nigeria disabled the Nigeria Open University from institutionalizing AIDS policy. Acting as a transactional distance, this compromised educational interventions that were potentially life-saving. Likewise, Zambia's educational policy paper (Siaciwena & Lubinda, 2008), the different policy documents of Botswana (ADEA, 2003a) and South Africa (SAIDE, 2003), and the Draft Educational Strategic Plan of Mauritius (MEHR, 2008) highlight DE's potential to widen access, but its full-fledged implementation is conspicuously absent despite the fact that its multiplying use and institutional policy development are regularly noted. This deprives many audiences of educational opportunities. The focus is shifted now to Mauritius, an upper middle income SSA country (World Bank, 2009).

DE Policy Development in Mauritius

Policy-based transactional distance is also experienced in Mauritius. Official records indicate that first-generation DE was present as far back as 1865 in Mauritius with students registered on the London University external correspondence programs and examined locally (TEC, 2001). In 1971, the creation of the Mauritius College of the Air (MCA) to provide dedicated DE facilities, three years after independence, heralded a new era for DE. Indeed, Lord Young of Dartington was simultaneously setting up the UK Open University (UKOU) and the MCA in Mauritius. With the same vision informing both institutions, it would appear that the MCA carried as great a potential, albeit on a smaller scale, as the UKOU. However the UKOU became an internationally known institution informed by supporting policies, while a policy deficit led to the MCA's DE ambition being superseded by a more appealing media vocation. In the 1980s, there was renewed interest in second generation DE. Successively, consultants of international repute like Radcliffe (1988), Daniel (1989), and Lord Young again (1989) studied how to optimally develop and implement DE. Their reports were incorporated in the 1991 Master Plan on Education (MEAC, 1991), which highlighted the immediate need for coordination, planning, quality assurance, and prioritization as well as continuous evaluation of DE provision for working people, housewives, school drop-outs, or those wishing to continue learning.

The driving forces behind this initiative aimed at improved quality and cost-effectiveness of educational provision (MEAC, 1991, p.101). This became the dedicated role of the newly established Tertiary Education Commission (TEC) (MEAC, 1991, pp. 102-103) with regards to institutions under its purview. Again policy deficit led to ill-synchronized DE provision distributed among the MCA, the Mauritius Institute of Education, and the University of Mauritius. The initial implementation of the recommendations of the reports was not sustained and the major systemic restructuring that was required was not undertaken for "lack of national capacities of appropriation" (Sacks et al., 1996, p.14). Interestingly the policy deficit situation appears to be destined to persist because the recent Draft Education and Human Resources Strategy Plan 2008-2020 (MEHR, 2008) does not propose procedures to decrease transactional distances. Despite the long history and the reports that were instrumental in charting the first

policy position, little has happened. The discourse remains prevalent but there is no demonstrable progress. The following analytical framework proved useful in understanding implications of national policy deficit at institutional and national levels.

Theoretical Framework

Two operational definitions have been retained for the purposes of this research project. *Classical* DE refers to those distance learning environments that favor print-based media, which may include audio-visual, satellite, telephony, and e-mail based transactions (Glikman, 2006, p.10) but preclude an electronic educational platform. *Online* DE refers to a type of educational transaction carried out on an electronic platform that favors student-student, student-content, and student-tutor interactions and carries all resources that support the learner's educational itinerary. The research framework and analytical matrix incorporated the following: transactional distance theory (TDT) (Moore, 1993; Moore & Kearsley, 1996, 2007; Moore, 2007); Deschênes and Maltais's (2006) categorizing principles of student persistence (cognitive, metacognitive, and affective); a participative and inclusive outlook based on the systems approach (Saba, 2003, 2007); and the ADDIE-E model of program planning (Gokool-Ramdoe, 2008).

Transactional Distance Theory (TDT)

Since DE is characterized primarily by distance (Moore & Kearsley, 1996) the most appropriate theory from which to study a DE problem is a DE theory. Gibson (2003) and Glickman (2006) flag the atheoretical nature of most research carried out by DE practitioners and the risks this represents in terms of understanding the discipline. TDT is concerned with independent study and highlights the shared responsibility of the teaching/learning enterprise with learner independence as the most important and desired outcome (Moore, 1993; Deschênes & Maltais, 2006). This outcome is the result of shared negotiation through dialog and structure between multiple permutations and combinations involving relationships between and among teacher, learner, course material, institution, culture, country, and so forth to decrease possibilities of misunderstanding. It accommodates all forms of DE and provides a conceptual tool that helps students and others to place any DE program in relation to any other (Moore & Kearsley, 1996).

Student Persistence

Student persistence is an important component in DE because without the learner there is no teaching/learning transaction (Sauvé, 1993). It is identified as a useful mechanism to gather market intelligence since it connects both the demand-side and supply-side perspectives. It implicitly carries consumer (student) and producer (institutional and state) perspectives. It is a function of teaching and learning activities and penetrates the core of institutional practice.

Deschênes and Maltais' Organizing Principles of Student Persistence

In discussing factors affecting student persistence, Deschênes and Maltais (2006) intertwined existing notions into principles for categorization. These became all-encompassing, organizing principles. Four essential aspects of the learning experience are covered by these principles: *cognitive*, the processing of information through instructional strategies to increase or broaden knowledge; *affective*, strategies that enhance the meaningfulness of the learning experience (based on extrinsic and intrinsic motivators, especially dealing with the realm of feelings); *metacognitive*, the awareness of and ability to manage one's own cognitive processes (Hannafin et al., 2007, p. 130), thus implying strategies that help the student organize and take responsibility for the learning experience; and *socio-economic*, which includes all the variables inherent in the student's public and private spaces that he/she interacts with and that may affect his/her affective and metacognitive, rather than cognitive, skills.

The Systems Approach to DE Planning

The systems approach (Moore & Kearsley, 1996, p. 5) sees DE issues, appropriately, in a simultaneously compartmentalized and comprehensive manner with components and sub-components that are seamlessly woven into a whole. While the sub-systems or components are broken down into easily manageable functions, one does not lose sight of the interrelationships between the parts. The original ADDIE model stands for **analyze, design/develop, deliver, implement/interact, and evaluate** (Cafarella, 2002; Moore & Kearsley, 1996). It was modified to include an additional component, the environment (including context and culture at institutional and national levels) where the educational transaction takes place (Gokool-Ramdoe, 2008). It is seen as a template into which information about student and organizational needs (teachers, program developers, logistics, administration, and support components) are fed so that they are constantly reorganized with a view to providing a better fit between needs and provision, thus decreasing transactional distance. The additional 'e' in the comprehensive planning process recognizes the diversity of audiences and students' contextually/culturally driven needs. Thus globalization, technology, and leadership issues – the inter-articulation of which is more easily understood through the ADDIE-E model – also influence policy development (Dirr, 2003; Beaudoin, 2003; Woudstra & Adria, 2003).

Methodology

Inquiry Tools

The TDT was useful for developing the interview schedules for students and stakeholders. It enabled probing into all the components of distance education, as indicated by the ADDIE-E model. Data from participants were collected in the first instance from in-depth individual interviews that lasted almost an hour each. The structured interview format enabled clarification, restatement, and explanation within a given focus to elicit responses from participants (Merriam & Simpson, 2000, p. 152).

Participants and Programs

The participants were recruited on the basis of convenience sampling (Trochim, 2006). The University of Mauritius has two DE departments: the Centre for Professional Development and Lifelong Learning (CPDL) and the Virtual Centre for Innovative Learning Technologies (VCILT). The CPDL offers diploma and bachelor level courses through classical DE and face-to-face methods (see <http://www.uom.ac.mu/CPDL/index.htm>), and the VCILT offers certificate to master’s level programs essentially through online technologies (see <http://www.uom.ac.mu/CPDL/index.htm>). DE provision is based on a blended model, which involves multiple face-to-face meetings. Study respondents were drawn from the DE student population as well as a range of stakeholders. Twenty students ($N = 20$) were interviewed: 10 classical ($n = 10$) and 10 online ($n = 10$) (see Table 1).

Table 1

Profile of Classical (C) and Online (O) DE Learners

Demography	Profile/Data																			
Student number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Age	36	22	24	21	26	20	27	36	26	30	33	33	35	35	25	27	28	37	34	25
Classical/Online (C/O)	C	C	C	C	C	C	C	C	C	C	O	O	O	O	O	O	O	O	O	O

The online students were all postgraduates reading towards a master’s of science degree in Computer Mediated Communication Pedagogies (CMCP). This program entailed an initial face-to-face induction with most tutorials being carried out on the online learning platform, Moodle. Occasional face-to-face sessions were organized on demand. The classical students were all undergraduates registered on two different programs, the bachelor’s of science degree in Financial Management and the diploma in Management Studies respectively. The print-based, instructional-designed learning material relied heavily on weekly, Saturday face-to-face sessions. Stakeholders included students, teachers, instructional designers, administrators, and educational technologists. Table 2 indicates their position within the University as well as their relationship with students, type of DE experience, and duration of involvement in DE.

Table 2

Profile of Respondents

	1	2	3	4	5	6	7	8	9	10
Gender	F	M	M	F	M	M	F	M	F	F
Age	35	38	N/A	36	38	N/A	34	30	N/A	44
Position	I/D	AL/L	E. A	S.L	AL/L	P	AL/L	S/L	AL/L	AP
Relation with students	L	L&c/w	Admin	L&c/w	L&c/w	L&c/w	L&c/w	L&c/w	L&c/w	L&c/w
DE experience type	C	C	C	C	C&O	O	O	O	O&C	O&C
Years of experience	11	2	13	6	5	20	5	7	5	7

Key: Instructional Designer : I/D; Assistant Lecturer/Lecturer: AL /L ;Senior Lecturer:SL ; Associate Professor: AP ; Professor: P
Lecturing/Course Writing: L/c/w; Executive Assistant: EA Online: O; Classical: C

Stakeholders ($N = 10$), i.e., administrators, course writers, managers, instructional designers, and teachers, were also interviewed; five ($n = 5$) belonged to each of the two distinct groups. Their voluntary participation was agreed to in their signed consent letters.

Research Limitations: A Note of Caution

Convenience sampling is a non-probability sampling method that relies on voluntary participation. As such it may leave out an important number of potential respondents. Responses are only indicative and not representative of the whole student population. In addition, convenience sampling does not allow the emergence of cross section data. Sampling size may impact negatively on generalizability and replicability. However available data provided sufficient pointers for the foundation of a policy on which other information may be grafted for use as the applications of the TDT are further extended.

Findings

Data indicated that policy deficit was indeed a transactional distance demonstrable through the gap between learner needs and institutional provision. No mechanism captured national requirements or learner needs, which called into question institutional provision as well as teaching/learning processes. Additionally, learner independence and persistence were not promoted as an engineered institutional strategy; rather, they were an accidental outcome. The qualitative findings were categorized according to the questions set, which fitted the organizing strands: cognitive, affective, and metacognitive strands respectively. These were further sub-categorized into interaction and culture/context. Data generated by the stakeholders will be discussed, beginning with the students.

The Students

During the interviews with the students the following notions pertaining to individual characteristics were kept in mind: age, earlier experiences, attitudes toward learning, resilience, autonomy (that is, whether or not they could easily study on their own or required assistance from teachers, peers, and/or the institution), awareness of support services as a concept and as a facility, profession, and level of program of study. Responses were divided into interaction and culture/context concerns.

Interaction: Teacher/learner relationship.

The teacher/learner relationship was the most discussed topic. Most classical students were simply concerned with completing the learning program; they took negative teacher responses in their stride. Some students expressed a sense of inadequacy with regards to encounters with authority, management, or teachers. Highly prevalent attitudes included fear of the teacher, anxiety regarding humiliating experiences, and unwillingness to take control of their learning. Student 1 helplessly recoiled at verbally violent situations that clearly were not conducive to positive interaction: "...A lecturer cannot shout at you, sorry."

In such cases, interaction could even foster counter cognitive impacts. Moreover, teachers' unavailability was perceived negatively. Student 2 reported the following: "The [teachers] don't have time to listen to you. My favorite teacher's class was very interactive; she invited a lot of participation. ... It's not the same for other teachers though."

While speaking about some teachers and their teaching styles, student 1 concurred: "Classes are monotonous and strongly lack interactivity: these are often only monologues... there is ...no way to raise interest in the subject, no real inspiration. There is a total lack of interactivity from the lecturer."

The 10 classical students appeared to have mixed feelings, ranging from boredom caused by the highly didactic face-to-face methods to inspiration spurred by committed teachers. The high number of students attending the time-constrained sessions led to limited opportunities for individualized interaction. This condition was borne as a hopefully short-lived sacrifice. Many teachers went the extra mile to meet learners individually, especially one inspirational teacher whose efforts were widely appreciated and who inspired the wish among students that such dedication could be replicated by other teachers. Online students were more positive and confident in their interactions with their teachers; this may be attributed to their professional and post-graduate status (most were teachers) and the accompanying level of self-confidence. However most ($n = 18$) expressed a strong need for the recreation of the teaching act similar to the classroom mode (Keegan, 1993), implying that learner autonomy was a rather alien concept among the students.

Interaction: Learner autonomy and support.

Learner autonomy indicates the degree to which students are dependent on or independent of their environment in the pursuit of their studies. Metacognitive skills are necessary for the development of learner autonomy. Most classical distance learners required frequent teacher presence and support, thereby demonstrating lower levels of autonomy. Respondents concurred that the support that permitted the development of metacognitive skills was mostly available from their private spaces: family, spouses, or even bosses. Student 9 illustrated this generally held view as she anticipated changes in her life, e.g., marriage, and recognized the support provided by her fiancé and her in-laws. Also, she was able to persist because her boss “is doing his MBA and ... he is flexible since he is very understanding and keeps encouraging me in my [studies].”

Despite the lesser autonomy demonstrated by classical students, the mandatory weekly face-to-face sessions were a controversial issue. Some students claimed that these were a necessary complement to the course material; others resented the sessions because they interfered with their personal commitments. They argued that the print-based material should have been comprehensive, and face-to-face sessions should not have been mandatory. Making the face-to-face sessions elective would have spared students of the obligation of attending, especially when as adults they judged that they did not require particular sessions. This became a critical issue when attendance entailed major household reorganization efforts, including baby-sitting and so forth. They had difficulty reconciling their need for teachers’ presence with their adult commitments and time constraints, which contributed to frustration and some views that sessions were of varying quality, relevance, and helpfulness. Student 5 expressed this frustration:

The course materials are not sufficient ... lecturers ... ask us to go to the library for further reference but this also becomes difficult because we have to work, ...we are free only on Saturdays and all our Saturdays are taken up with face to face sessions.... [we] waste a lot of time depending on public transport. Time and transport become a problem...I have a lot of personal commitments...and often suffer from fatigue...

The students felt that the institution should have been more sensitive to their adult commitments and should have provided some solutions. Conversely, the online distance learners presented more field-independent characteristics, interacting when it was constructively or socially required. They claimed to be more in control and confident in negotiating their learning experience. They appeared to experience less transactional distance in terms of time, space, and interaction with their tutors, and they expressed their autonomy ($n = 10$). Teachers being just a click away and fellow students being accessible on Moodle or within easy geographic access enhanced that independence.

As with the classical learners, some insecurity gradually appeared in their need for the physical presence of the teacher or for institutional/technological support. Some indicated that the learning platform was problematic and that the choice of learning groups was not as democratic as they

would have wished. This compromised the level of control they had over their leaning experience and impacted negatively on student-student-learning material interaction. It contributed to dysfunctional working groups as student 17 declared and as student 16 explained:

At times the platform would crash so ...that caused us a lot of problems for communication. Another problem was caused by the fact that we were not allowed to choose group members. The lecturers ... did that for us.

General interview data from the students ($N = 20$) revealed that their initial concern about interaction was gradually buried under the layers of time that passed as well as homework and personal and professional obligations. They accepted their choiceless lot without much complaint, and they were grateful for the opportunity to belong to a recognized university. What then was the element that prevented the institution from recording dissatisfaction with teaching/learning processes? The answer was culture.

Culture and choiceless persistence.

Cultural influences were highly pervasive. Students' docile and unquestioning demeanor characterized this. They trusted the fact that they were registered with a nationally recognized institution and had faith in the teaching/learning processes. While they found the concept of more independence desirable, nearly all students ($n = 18$) were worried about how to handle independence: teacher control was a habit that was difficult to undo. Accustomed to not contradicting teachers, students were mostly docile during interactions. They were reluctant to shift the locus of control from the teacher or organization, there were few complaints so as not to offend the teachers, and most students kept a very low profile, intent only on graduating. Their intrinsic desire for meaningful learning experiences was gradually superseded by the extrinsic motivation of simply earning a recognized qualification.

Students reported that DE programs were characterized by non-flexible and non-negotiable pacing. The purported lack of individual treatment was especially apparent in the cohort-based approach and the mandatory face-to-face sessions that encroached on students' private spaces. Many students, e.g., student 5, argued that this attitude held little regard for their personal circumstances. The students did not feel capable of discussing this issue despite the fact that they felt it strongly. Students were satisfied that the qualification given by the University of Mauritius was recognized and was a passport towards professional advancement, as shown by student 1's statement:

My final objective... is what is encouraging me to stay on this program. I am strongly motivated to complete this course, so ... nothing can urge me to drop out. Other reasons would be too minor. Whatever happens in the course or about the course does not really matter.

While aware of the desirability of a meaningful learning experience, they were passive spectators of the way that education was delivered to them and were shortsighted about the opportunities that should have been available to them. Such information is crucial for evidence-based participatory policy development.

The Stakeholders

Stakeholder interview data revealed concerns that were similar to those expressed by the students. Responses were polarized in two directions: interaction and work culture. Among the 10 stakeholders interviewed, there were five who were engaged in classical distance education and five who were responsible for online DE provision. Among the classical DE staff, one was a fully trained instructional designer, who adroitly and effectively guided teams of subject experts. The online educational cadres were fully trained in educational technology ($n = 3$), while subject experts ($n = 2$) blended the electronic services with face-to-face provision. One classical distance teacher also taught campus-based students electronically. In addition, the teaching classical DE staff ($n = 3$) had a full working load with campus-based students. The interest in distance teaching of interviewed staff members stemmed from an intrinsic motivation to broaden their range of experiences. Responses again seemed to be polarized into interaction and culture, particularly work culture. Transactional distances seemed obvious.

Interaction.

In the absence of well-delineated DE institutional policy, stakeholders reported various challenges. Interaction was facilitated to some extent by the course material and the face-to-face sessions. However, some interviewees declared their dissatisfaction with the latter, prompted by their awareness of students' needs as well as their felt inadequacy to meet these needs through the course material. This inadequacy resulted directly from a policy deficit, which entailed their own unawareness of the implications and procedures for distance teaching and instructional design as well as the etiquette for interacting with students. This led to an uneven quality of the material, thus compromising interaction. Academic 1 pointed out the following: "Students are given manuals of uneven quality depending on the variable professional expertise of the teachers on the writing panel...There is ... no external review."

Although students had complained about the mandatory attendance at face-to-face meetings, this inordinate frequency of meetings was justified by teachers' felt insecurity and lack of confidence in DE as a quality teaching methodology. Again there was a need to re-create the classroom-type teaching act (Keegan, 1993), thus limiting opportunities for the development of metacognitive skills and learner autonomy. Under this pressure, stakeholders were worried that their workload may prevent them from providing adequate individualized interaction and feedback. Academic 2 reported that their most discussed needs must be addressed, such as training in DE methodologies, student support, and logistics and technical infrastructure that support interaction as well as the relevant work culture.

Work culture.

Work culture involved institutional and national frames of reference. Participation in DE arose from curiosity or from a desire to earn some extra income or to gain new experience that could prove useful in future. The belief that the institutional direction was appropriate was dictated by the proud fact that the institutional policy had preceded a national one and the fact that the nationally recognized institution was responding to a few lines of the Master Plan (MEAC, 1991). However DE practice revealed some obstacles that could be ill-understood but doggedly overcome. The stakeholders reported being swamped under heavy workloads; they were generally ill-equipped to cope with the tensions involved with distance as well as face-to-face teaching. They expressed their desire for an appropriate policy to overcome this lacuna, including codified and communicated mechanisms and processes for recruitment, training, and staff retention (Sherry, 2003). The current policy deficit implied extra work with regards to DE practice, as academic 10 stated: “One needs to complete existing hours of work, so that’s why not many lecturers are willing to undertake the extra load.”

Flagging the national policy deficit concern, data indicated that academics felt the need for a dedicated policy that could help their professional planning. As academic 9 argued, “We need to have national guidelines for the country.”

Despite the fact that the Master Plan (1991) had indicated the importance of developing DE and that no dissatisfaction was overtly documented regarding its deficient provision, its implementation was nowhere discussed. In conclusion, most stakeholders argued that the TEC had to be more forceful in its policy development and quality monitoring role in relation to the following issues: encouragement of further participation in DE initiatives, workload and recognition, individually and nationally responsive programs, marketing and student persistence, institutional leadership, quality, and policy framework.

Conclusion

The findings confirmed that policy could indeed be taken as another dimension of transactional distance. At an individual level, a national and institutional policy deficit meant that students were unaware of the implications of DE and of the opportunities for the flexibility of the program to work around their lives rather than the other way round. Students mainly persisted out of choicelessness and unawareness, which glossed over numerous glitches in the teaching/learning process. No mechanism existed to detect the students’ personal circumstances, their level of preparedness to embark on distance education, the media format used, the type of program, the level of student maturity to handle the learning process, and their eventual satisfaction. Students did not have the spectrum of course choice and learning options that may be the most suitable for their needs. Metacognitive and affective skills remained undeveloped, especially learner autonomy.

An advocacy plan would help students to understand legitimate expectations from DE and to develop the necessary skills for interaction (tutor-student-course material-organization), for time-

management (including skills to negotiate personal and professional commitment), and for the cultivation of necessary personality traits to seamlessly integrate local culture with innovative learning expectations. An important pillar of this plan is feedback mechanisms that would feed field intelligence from the students into policy development. This would continuously ensure the closeness of match between learners' cognitive, metacognitive, and affective circumstances and institutional provision. Awareness of the opportunities, benefits, and disadvantages of choosing this mode of learning over any other will equip the learner with the necessary confidence so that his or her progress is not a matter of choicelessness but of meaningfulness.

At an institutional level, policy will enhance existing commendable efforts, broaden professional opportunities, deploy resources effectively in such areas as capacity building, career planning, quality teaching, management, and administration, and support the development of reward and recognition programs. Capacity building will enhance quality by equipping cadres with the required skills to develop flexible and culturally responsive DE initiatives for the market and for nationally responsive interventions. Thus there is a need for national DE policy as a policy development matrix framed by the TDT, the systems approach, and the ADDIE-E model of program planning as well as by Deschênes & Maltais' organizing principles for student persistence. Student persistence has been an appropriate mechanism that has usefully connected supply and demand side variables. This research has validated TDT as an instrument for policy development, which could be useful in Mauritius and in SSA. Evidence from the literature review and interview data has demonstrated the implications of a national policy deficit in SSA countries, including Mauritius. These preliminary indications need to be further researched and discussed.

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Appendix

INTERVIEW SCHEDULE FOR STAKEHOLDERS

Gender

Age

Position within the University

Relationship with distance students

Type of distance education experience:

1. How long have you been involved in distance education provision?
2. Could you provide a detailed description of your particular involvement?
3. From your experience of distance education students, what do you think encourages students to stay on a program or to drop out from it?
4. What, do you think can be described as support strategies to encourage learners stay on a course or drop out of it?
5. Do you believe the students you deal with have access to the facilities you describe?
6. By what mechanisms, if any, do you systematically collect data regarding whether these strategies are adequate?
7. Does this feedback indicate whether these facilities are sufficient and will promote their retention or be predictors of their attrition?
8. How would you describe the quality of the program on offer with regards to students support services?
9. Do you have any suggestions for its improvement?
10. What are the possibilities that your suggestions will be implemented at the University of Mauritius?

INTERVIEW SCHEDULE FOR STUDENTS

Gender

Age

Course level – Masters

Bachelors

Diploma

Certificate

Type of distance education:

1. Can you describe your learning experiences as a student – from school onwards? Is there any particular instance that you think is memorable and why? Why did you choose a distance learning course as opposed to a face to face one?
2. What are the factors that you can say help you enjoy this course?
3. What are the factors that prevent you from enjoying this course?
4. Can you describe reasons that would encourage you to stay on this program AND reasons that would encourage you to drop out?

5. What, according to you is meant by student support services?
6. Do you have access to all of these/some of these or none these? Do you think that you have access to these facilities at the time you require them?
7. If you have access to this range of facilities, would you say they are adequate or not adequate?
8. If you believe that they are not adequate, can you describe what else would you need in terms of support to make you view your educational experience as a totally satisfying one?
9. If you do need some kind of support that you believe is necessary at that given point in time, would you ask for it? Would you have access to it?
10. From your experience as a student, would you say the same type of support facilities exist for both types of distance learning formats at the University?
11. Which type of distance education would you prefer if you had a choice – the classical or the online type?



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Crossing the Chasm – Introducing Flexible Learning into the Botswana Technical Education Programme : From Policy to Action

Alison Mead Richardson

Botswana

Abstract

This paper reports on a longitudinal, ethnomethodological case study of the development towards flexible delivery of the Botswana Technical Education Programme (BTEP), offered by Francistown College of Technical & Vocational Education (FCTVE). Data collection methods included documentary analysis, naturalistic participant observation, and semi-structured interviews. The author identifies and analyses the technical, staffing, and cultural barriers to change when introducing technology-enhanced, flexible delivery methods. The study recommends that strategies to advance flexible learning should focus on the following goals: establish flexible policy and administration systems, change how staff utilization is calculated when flexible learning methodologies are used, embed flexible delivery in individual performance development and department/college strategic plans, ensure managerial leadership, hire and support permanent specialists, identify champions and share success stories, and address issues of inflexible organisational culture. This study may be of value in developing countries where mass-based models are sought to expand access to vocational education and training.

Impact of E-Learning Policy on Institutional Staff

In institutions, translating policy into action can be precarious and time-consuming. Wright, Dhanarajan, and Regu (2009) point out, “Government and institutional personnel in developing countries often decide to employ e-learning or online learning without fully realizing what it means for their students and their institutions.” This study confirms and builds on this statement, focusing on the impact on institutional staff.

The National Context

Botswana is one of Africa’s success stories (Siphambe, 2000; Freeman & Lindauer, 1999). Following independence in 1966, the country has been transformed from one of the least developed countries, with 90% of the population subsisting in drought-prone agriculture and a per capita income of about US\$80, into a middle-income country, with 50% of the labour force

employed in formal sector activities and a per capita income estimated in 2004 at US\$3,451 (Hough & Short, 2007).

Despite this rapid transformation, Botswana faces a huge challenge in developing a skilled population, which can further contribute to national development. This is partly due to the capacity of the education system to meet demand. Due to the successes of the focus on the goals for Millennium Development and Education for All, most African countries are grappling with the question of how to increase access to post-secondary education (Perraton, 2000). Botswana is no different. “There is also evidence that the economy is unable to cater for the increasing numbers that have emerged from the expansion of primary schools” (Akoojee, 2005). A net primary enrolment ratio of 100 was reached in 2000 (Botswana Education Statistics Report, 2002). This success has consequently expanded the secondary sector and increasing numbers of secondary leavers are putting pressure on the provision of post-secondary, or tertiary, education. The World Bank, in its Education at a Glance series, reports a gross enrolment ratio for secondary education that increased from 38 in 1990 to 73 in 2005 (World Bank, 2007).

Education Policy and Strategy

Educational development in Botswana takes place within the context of six-year rolling National Development Plans (NDPs). These are essentially plans for public spending and human resource use, and annual budgets are used as instruments for converting a development plan into a programme for action. The plan under which this study took place is NDP9, which states that the Department of Technical & Vocational Education & Training (DTVET) should do the following:

- increase training opportunities for out-of-school youth and people in employment through the development of distance education and e-learning packages in partnership with the Botswana College of Open and Distance Learning (BOCODOL) as well as through the construction of learning resource centres;
- enhance access to information and communication technology (ICT) and use state-of-the-art technology and e-learning to improve the quality and delivery of technical education programmes;
- improve effective utilisation of facilities by extending hours;
- provide learning modules as distance education and e-learning packages;
- establish e-learning resource centres linked to technical colleges;
- seek technical assistance to address these new areas of development; and
- provide all lecturers with professional teaching skills using both full-time and distance /e-learning delivery.

The guiding policy in education in Botswana is the Revised National Policy on Education (RNPE) 1994. In it, the Government of Botswana (GoB) has acknowledged that vocational education and training (VET) is crucial to the country’s economic diversification from an agro-based to an industrialised economy. The RNPE 1994 indicates that the Government should take responsibility for initial broad-based vocational education, while employers should be responsible for more job-specific or specialised vocational training.

The Vocational Education & Training (VET) Policy of 1997 focused on the need to expand access to VET and to make it more inclusive and equitable whilst addressing issues of quality and cost-efficiency. The policy identified that traditional delivery methods do not meet the needs of the broader profile of VET students existing in the country.

- 3.17 Traditional modes of programme delivery are widely used but their exclusive application does not always meet the requirements of a modern labour force and are not adequate for certain target groups. There is a need to diversify modes of delivery. Curricula and programmes will emphasise:
- flexible modes of delivery that will facilitate the achievement of competencies by trainees
 - modes of delivery that are adaptable to new technologies and responsive to technological changes
- 3.18 Through pilot programmes, new modes of delivery will be explored. These include development and testing of different modes of distance education. (GoB 1997)

Clearly the educational policies are pointing in the direction of more flexible teaching and learning methodologies with an emphasis on distance learning provision and the use of technology to address issues of increased access and equity and improved quality with cost-effectiveness.

The Post-Secondary Access Problem

The first choice for most secondary school leavers is university but tertiary provision has not expanded at the same pace as basic education. Of the approximately 20,000 senior secondary school leavers annually, there is a net enrolment rate of less than 12% in post-secondary education (GoB, 2005). Projections from the Planning Unit at the Ministry of Education & Skills Development (MoESD) suggest that by 2016, this number will have risen to 37,000. Information from the University of Botswana suggests that currently out of 20,000 Form 5 leavers each year 18,000 would be traditionally eligible to apply for university. The university admits 5,000 students, of whom around 3,500 are school leavers, 1,000 are adult workers, and 500 are moving from one qualification to another. This leaves approximately 14,500 eligible school leavers unaccepted at the university. With the university currently taking only 3,500 school leavers each year and teacher training colleges admitting about the same number, there is clearly a huge shortfall in tertiary provision with perhaps more than 10,000 senior secondary school leavers, each year, with no tertiary destination.

Where do these young people go? Some go to the Agricultural College but increasingly they are turning to vocational education and training, traditionally delivered by government institutions but more recently by the growing number of private institutions in the country. Of the 124

institutions registered by Botswana Training Authority (BOTA) in December 2008, more than half are private providers.

The Government has long recognised this impending bottleneck in tertiary provision and, through the national development planning system, has taken the following actions:

- increased enrolments at the University of Botswana;
- set up the Tertiary Education Council to support and regulate tertiary provision in both public and private institutions;
- created a second university, Botswana International University of Science & Technology;
- built two Colleges of Applied Arts and Technology through DTVET;
- changed the remit of DTVET to take over and expand 41 Brigades which were formerly community based training-with-production units; and
- identified distance learning as a way of increasing access to TVET as well as ensured that DTVET has included the introduction of distance and e-learning for the Botswana Technical Education Programme (BTEP) in its strategic plans.

Department of Technical & Vocational Education (DTVET) Policy and Strategy

Taking up the mandate provided by the 1997 VET Act, a major curriculum initiative was launched by DTVET in the same year to develop and implement the Botswana Technical Education Programme (BTEP). Designed in collaboration with industry and the Scottish Qualifications Authority to meet the needs of a modern and flexible economy and to encourage graduates to become lifelong learners, BTEP was introduced in 2001. It is a modularized, outcomes-based programme, which is designed to be delivered flexibly in a variety of modes to a wide range of different learners using individualized, constructivist methodologies.

The DTVET Strategic Plan 2004-2009 states that by the end of the plan period, 20 units of BTEP will be offered by distance learning. Budget lines have been allocated to facilitate this; however, the principal of FCTVE reports that these funds have been held centrally and have not been made available to the college.

Research Methodology

The introduction of new teaching and learning technologies at FCTVE was essentially a naturally-occurring experiment, and it was important to find out what people did to make sense of the process. Approaching the study without a pre-determined hypothesis enabled themes and issues to emerge from the fieldwork rather than from the hypothetical standpoint (Patton, 1990). Flexibility in research methodology was important so the design could unfold as the fieldwork progressed. A process study focuses on *how* something happens rather than on the outcome or results.

Documentary Analysis

Documentary analysis was a critical element in the data collection. A good deal can be learned about an organisation by its documented strategic plans, policies, and procedures. In addition, minutes of meetings can be a rich source of information in a longitudinal study as they document priorities and discussions on salient issues. As the research progressed, it became clear that there was a wealth of documentary evidence, which had not been identified initially, such as workshop flipcharts, programme descriptions, and reports from other consultants and technical assistants. These documents were also analysed and provided rich data; for example, workshop flipcharts from sessions with heads of departments (HoDs) showed how more flexible approaches became part of the college discourse over time.

Participant Observation

Participant observation was suitable as the researcher was an adviser to the college staff and carried out the role of ‘expert’ in distance and e-learning. The study progressed with what Denzin calls an “omnibus field strategy” in that it “simultaneously combines document analysis, interviewing, direct participation and observation, and introspection” (1978). Daily interactions were focused on the process of implementing flexible learning programmes. The choice of research methods was based on the assumption that understanding emerges most meaningfully from an inductive analysis of detailed descriptive data gathered through direct contact with participants (Patton, 1990). Some specific assumptions were made:

- Conclusions could be drawn about the process of change by studying policy and other ministerial documentation and observing the implementation of those policies.
- Meaningful information could be gained from the lecturers and managers involved in the process.
- An ‘inside-outsider’ researcher can observe and comment meaningfully on the process.
- Reflexivity can be held to an acceptable level.
- The results of the case study can inform future policy and practice in the use of new teaching and learning technologies in DTVET.

This last assumption is potentially very wide. There is a complex relationship between research and policy. Research does not feed directly or simplistically into policy-making.

Sampling

The study used a purposive sample: Respondents were specially selected to provide information-rich responses. Some respondents were selected because they held a certain role and responsibility within the system and others because of what they were doing, or not doing, in relation to the move towards more flexible teaching methods. During the initial exploratory

fieldwork, observations were made and emerging patterns were identified. Later, specific respondents were selected to provide more focused information on specific issues and an attempt was made to explore the observed behavior in more detail. Patton (1990) calls this a move from an exploratory process to confirmatory fieldwork. Interviews were conducted with more than 30 respondents, including policy-makers, college managers, and lecturers. Key individuals, such as the college principal and lecturers who were of particular interest, were interviewed two or three times.

Research Constraints

There were some important constraints on the research. One of the main concerns for a naturalistic participant observer is the issue of reflexivity. In qualitative research, the researcher is the research instrument (Patton 1990; Cohen, Manion, & Morrison 2000). Reflexivity acknowledges that qualitative researchers are inevitably part of the social situation they are researching and inescapably have views and interpretations of the meanings of that social situation. This researcher had to be very careful to guard against imposing her own constructs on respondents during interview and content analysis. It was necessary for the researcher to closely monitor interactions with respondents in order to avoid bias.

The common constraint of time applied because the research was spread over a two-year period and large quantities of qualitative data were collected. It was important to design time-efficient data collection methods in order to achieve the detailed level of research required. The sheer weight of data that is collected during participant observation and the research skills needed to effectively analyse and attribute meaning to this enormous quantity of data require a large allocation of time. Field notes are of critical importance for a participant observer. The field notes taken during a longitudinal qualitative survey cover a vast amount of data, which must be recorded and analysed.

Initial ideas on the research methodology had to be adapted when it became clear that they were unworkable. An early plan was to request key staff members to keep a journal or diary of their activities and their reflections on those activities as they learned to use the new teaching and learning technologies. However, it quickly became clear that staff members were unlikely to commit to doing this in a sustained and useful way, so this method was dropped. The planned use of Internet chat systems for conducting interviews also proved to be unworkable as respondents did not have the required levels of skills or confidence in the use of the technology. This meant that the initial research design for interviews had to be re-thought in the light of the context of the respondents.

Results

How Flexible is BTEP?

The BTEP Guide to Implementation (GoB, 2004) states the underlying principles of the BTEP curriculum as a commitment to providing flexible entry and exit points, flexible access to learning and assessment, and equality of access for all potential candidates. Colleges are guided to make decisions on how they will provide a BTEP candidate-centred approach to learning and flexible delivery of BTEP units.

In reality, whilst the design may have been flexible, many teaching staff have limited teaching skills, which means the delivery has become rigid and inflexible, leaning towards didacticism with many staff unwilling to work flexibly and courses being over-taught (Morris, 2007). This view is reflected by comments from college staff and managers.

The design of BTEP is very flexible, but it is the implementation which seems to be rigid. Some teachers hang on to the old ways of teaching and then we don't feel the full potential of the programme.

It is not flexible – well maybe in name only. It is outcome-based but delivered within very rigid structures. When we try to deliver more flexibly then other people in the college want to do it in the traditional way.

So far, BTEP delivery has been only by conventional face-to-face educational methods. But in tandem with the creation of BTEP, DTVET planned to broaden the delivery methods of VET in order to meet the demands of increasing access. In the late-1990s, DTVET entered into a partnership with the European Union (EU) to build a new flagship technical college in Francistown in the north of the country. This is the seventh technical college in DTVET's stable and the new college is mandated to offer BTEP nationally through both "traditional and flexible and distance education methods." Along with building the new college and providing advanced ICT networking infrastructure, the EU/GoB funding provided a technical assistance (TA) team. The TA team included experts in ICT networking, ICT systems administration, instructional design, e-learning, and distance education. The role of the team was to help operationalise the new college and to help the staff of the college fulfill their mandate to introduce new teaching and learning technologies. Because of their expert knowledge, the members of the team were contracted to be change agents in the process of bringing flexible teaching and learning approaches into the government VET system, starting with Francistown College of Technical & Vocational Education (FCTVE). The intention was to set up an innovative new college that would pioneer the use of ICT in teaching and learning in technical and vocational education and that would provide a model for other institutions to follow.

The college started operations in April 2007 with an initial staff complement of 35 making preparations to offer BTEP in 10 vocational programmes: Business, ICT and Multimedia, Hospitality Operations, Travel and Tourism, Clothing Design and Textiles, Hairdressing and Beauty Therapy, Construction, and Engineering.

Introducing New Teaching and Learning Technologies

In order to start the transition to flexible delivery, a number of activities were initiated by the TA team:

- provision of access to the technology and to the skills and knowledge to use it for teaching and learning,
- training needs analysis and design of a staff development programme,
- delivery and evaluation of staff capacity-building activities,
- analysis of the resource, staffing, and policy implications, which were reported to college and DTVET management, and
- support of the development of flexible approaches.

Remembering the classic Bates ACTIONS model (Bates, 1995), staff access was the first consideration, both in terms of physical access to the technology and of the skills to use it. DTVET provided a high-specification local area network at the college with Internet access through the Government Data Network. Following the recommendations of the Botswana National Strategy for eLearning Report (Uys, Mead, Fouche, & Adam, 2004) open source was chosen for the learner management software, and Moodle was recommended and accepted by the policy-makers.

A systematic approach to staff capacity building was advocated (Le Cornu et al., 2004) starting with a training needs analysis survey of all the managers, administrators, and lecturing staff. This provided detailed information on the skills and confidence levels of staff in terms of computer literacy and new teaching and learning methodologies. From this, a programme of capacity-building activities was developed for which staff members could enrol. Seminars and workshops were held to introduce new concepts in flexible teaching and learning as well as new pedagogic approaches and training in using Moodle. After making it possible for staff to start gaining the skills and knowledge they needed, it was believed that teachers would begin to re-design their BTEP units for flexible delivery.

There was a high level of participation in staff development activities in the first few months but interest diminished and it became problematic to get people to attend sessions they had signed up for. This was believed by the TA team to be due to a lack of interest on the part of college managers which quickly filtered down to staff. As the departments moved towards finalizing their preparation for students it became easier for them to rely on traditional approaches. One lecturer commented on the amount of time it takes to develop resources for e-learning delivery through Moodle; another talked about the “risk” of offering e-learning. A good number of lecturers attended all the staff development sessions offered but did not translate that into the development

of new approaches to teaching. One staff member saw this as a challenge to be addressed by management.

The other challenge for management – especially HoDs is for staff development. People attend staff development workshops just to satisfy the expectations of the HoD – they are not really interested in learning. This means that they cannot learn – and even if they do, they are not putting it into practice. So HoDs should undertake to do the follow-up and make sure that when lecturers get new skills that they follow through and create the new learning resources – even create e-learning units.

All teaching staff members were involved in the first college strategic planning cycle, and flexible learning was specified as an initiative to meet five strategic goals. Teaching staff commented that it was important to have policy and strategic plans that specified flexible learning for them to accept that this was something “coming from the top.”

A classic technology adoption lifecycle was noted (Figure 1) with a few encouraging “innovators and early adopters.” An interesting point about these colleagues is that unlike the model proposed by Rogers (1995) they were not unhappy with lecture-style teaching and initially had no fascination with technology. When asked why they had taken up distance and flexible delivery, some expressed a desire for personal development as lecturers; another said “because you asked me to!”

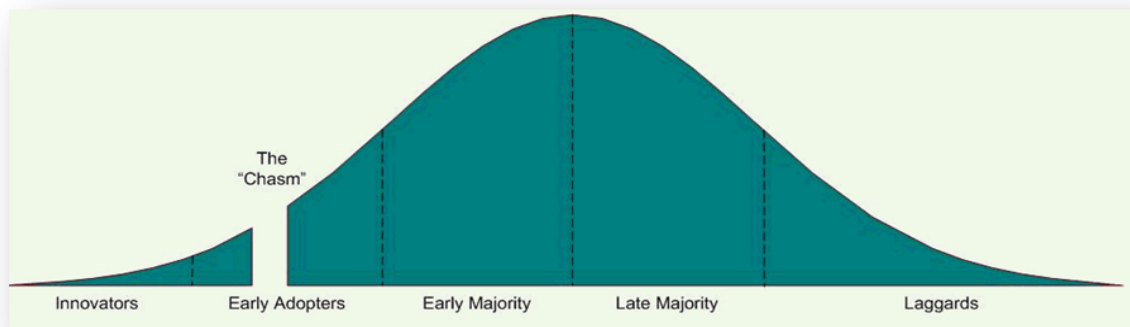


Figure 1. Technology adoption lifecycle (Moore, 1991 after Rogers, 1995).

Individual support to these staff resulted in a distance learning unit in Beauty Therapy being the first to enrol students to the college. Other early adopters developed flexible learning units in Hospitality Operations, Business, and Multimedia, and these staff benefited from individual coaching.

Change took place for one lecturer because she needed to find a solution to a lack of staff in her department; she was the only lecturer appointed to FCTVE. Distance delivery was identified as

the solution. She is now committed to developing her whole programme in a flexible delivery format. She commented,

I wasn't planning to do distance education when I came to FCTVE. But when I found I was the only staff member, what else could I do? And the PTEO supported me. Now I've learned to do distance education, I like it. I now know that it is important to increase access to BTEP with distance learning but I miss my students ... you know, seeing them every day.

In fact, she raised two interesting issues:

- Were staff members informed of the mission of FCTVE to introduce distance and e-learning into BTEP when they were recruited? Discussions with a number of teaching staff members suggest that no-one had been given any information on the flexible learning mission, although a few commented that they knew that FCTVE would have good ICT facilities.
- What impact does the involvement of the subject specialist/curriculum developer at DTVET have on the move towards flexible delivery amongst staff?

Challenges Encountered

Research into the uptake of online education by faculty carried out by Berge (1998) reveals that barriers to online teaching and learning can be situational, epistemological, philosophical, psychological, pedagogical, technical, social, and/or cultural. It is important to note that the majority of research into faculty adoption of technology has taken place within a context of higher education not TVET. We have yet to experience the breadth of the issues identified by Berge but can categorise the challenges we have encountered so far as technical, human resource, and cultural. There is a strong cultural emphasis on didactics and lecturing in the college, and this has not yet been sufficiently exposed and discussed in the initial activities. Research by Zellweger Moser (2007) in three research universities in North America indicates that time is one of the most important considerations for faculty when deciding whether to adopt technology. The unique situation at FCTVE is that many teaching staff members were employed at the college for up to 18 months before students joined the college, so lack of time to prepare new learning materials should not have been an issue.

Bureaucratic Systems

There are several systemic barriers to the promulgation of flexibility at the college. The main one is the restrictive nature of government staff conditions of service. In the Botswana government system, teaching staff are contracted for office hours and there is little flexibility in the system. Staff cannot be paid for working outside these hours. In order to offer evening classes, external part-time staff must be hired. Staff members report dissatisfaction with this system. They would be prepared to work outside hours to support flexible delivery but expect remuneration for this.

Time off in lieu is not always acceptable. In addition, staff members report a fear of being charged with “under-utilisation.” They feel they are judged by their contact hours with students, and flexible approaches, which reduce contact time, are viewed with suspicion. A recommendation was made to college management that the system of calculating staff teaching hours needed to be adapted to provide for flexible delivery. In distance learning, writing learning materials *is* the teaching and should be provided for in the same way as contact hours are in face-to-face teaching. As yet, the staff utilization mechanism has not been reviewed.

This was also an issue noted by Palmieri (2004, p. 92) in the move to flexible learning in vocational colleges in Australia in the 1990s. She quotes from a report of the ANTA Flexible Delivery Working Party (1992, p. 21): “Current input-oriented key performance indicators based on student contact hours and the utilisation of teachers and facilities are inappropriate for flexible delivery. They are a significant barrier to innovation and change.”

Lecturers also voiced concerns about the level of understanding of the issues involved in flexible delivery by college managers.

I'm not sure if the college managers really understand what flexible learning is all about. This is important because when you do flexible learning then some things have to be changed from the way they were done before. We need access to the LRC and even to the PC Labs in the evenings and at weekends for our students but that is quite difficult right now.

College managers, in turn, voiced concerns about the level of understanding of DTVET officers when they included distance and e-learning in their strategic plans.

It (distance and flexible learning) is reflected only as far as policy formulation is concerned. I have doubts about DTVET's conviction and commitment to the implementation of distance and flexible learning. There is no evidence of them putting up structures to make sure it is realised. There is no unit or even an officer in DTVET for distance and flexible learning, so where is the co-ordination going to come from?

Lack of Counterparts to the Technical Advisers

One of the biggest concerns reported by the college managers is the lack of counterparts to the TA team, which are needed for effective skills transfer. This is part of a wider concern about the lack of human resource for new teaching and learning technologies. There are no positions in the establishment to support the introduction of flexible learning. Apart from the TAs, there are few people with sufficiently developed technical or pedagogic skills to develop print-based or computer-based materials for flexible learning. A concern voiced by both managers and staff is that after the TA team has left the college, flexible learning will collapse, so in the words of one

lecturer, “why bother?” Even the principal has stated that the lack of provision of specialist staff to support flexible learning suggests to him that efforts may cease when the TA team leaves the college: “It’s the issue of permanence. The TAs are here on a mission but when the TAs are gone, we think that flexible learning will collapse. That influences peoples’ thinking – even mine.”

And one lecturer commented, “The problem comes now that it is time for the TAs to leave – who will drive the process forward now and support those teachers who have already started?”

It is clear that the project approach to change has substantial drawbacks. However, most staff and DVET officers acknowledge the need for external expertise with the introduction of new teaching and learning technologies. There is still some question about the efficacy of the use of TAs as change agents. Rogers (2003) points to the differences, or heterophily, between change agents and what he calls the “client system.” Rogers states that change agents tend to be substantially different from the people they are trying to persuade to change in terms of “language differences, socioeconomic status and beliefs and attitudes” (2003, p. 368).

Pushing the Boundaries

Even though we asked the “tough institutional policy questions” in advance, as advocated by Gellman-Danley and Fetzner (1998), and identified the challenges that were likely to arise, it was difficult for administrative colleagues to focus on, and deal with, these in abstract. What we found – as did Berge – was that administrative and policy barriers that are encountered during the development and delivery of pilot programmes can usually be overcome in order to solve specific problems (Berge, 1998). When presented with a problem that needed solving, support staff displayed flexibility and a willingness to help that was not evident when similar requests were made at the planning stage. When asked about this difference, one senior administrator responded, “Well you had students coming and I couldn’t let you down. I wanted to help you to make it work. But next time you will have to stick to the government system.”

Such comments point to Fullan’s (2006) statement, “In order to accomplish this goal [organisational transformation] it is necessary to change not only individuals but also systems.”

Meeting the Challenges

A cross departmental working group was convened to develop a strategy for implementing flexible learning at the college. In this forum, TA teams had an opportunity to explore the process of introducing flexible learning in more detail with heads of departments and other key staff. A phased approach was agreed upon, which started with challenging each department to find at least two ways to make their BTEP delivery more flexible. Unfortunately some departments proposed offering a short course, full-time and face-to-face, rather than the more technologically-enhanced deliveries envisaged. However, individuals in other departments did start to embrace more flexible content delivery methods and started using Moodle to present course content and formative assessments.

The working group suggested that the implementation of flexible learning should work through the government performance-based rewards system (PBRs) and individual staff performance development plans. The Government of Botswana has a highly defined performance management system, based on the *balanced scorecard* method of strategic planning (Kaplan & Norton, 1996). This system provides for individuals to achieve specific rewards for excellent performance over and above their salary. The working group proposed that enshrining activities associated with flexible learning in personal objectives and linking them to performance rewards would create an incentive to ensure the objectives are fulfilled to contribute to professional advancement. Although this was discussed with college managers, the concept did not filter down to staff and only one staff member (working closely with the TA team) included flexible delivery of a BTEP unit as an annual objective in the performance development plan. Unfortunately, both college staff and managers confirmed that the balanced scorecard system is not well understood or implemented: We understand how to fill in the forms, but we don't really understand the purpose," said one lecturer. And a college manager commented,

It is a good system but ... there is not really a good understanding of how to use it effectively to help reach our strategic goals. Neither the staff nor the management really understands it because it is very complex.

Collaborative Partnerships

One of the strategies to address the concern about lack of expertise in distance education at FCTVE, post-TA project, was a proposed collaboration between FCTVE and BOCODOL, the parastatal organisation with responsibility for improving access to school equivalency and vocational programmes for out-of-school youth, using open and distance learning methods. A proposal was made to collaborate on the development of BTEP Key Skills units, which can be studied at a distance through BOCODOL. Students with completion certificates from BOCODOL would then be given priority entrance to vocational programmes. This would relieve Key Skills staff from some face-to-face teaching and allow them to focus on remedial work and assessment, bringing potentially greater efficiency and quality to the system. Collaboration between DTVET & BOCODOL on distance delivery of vocational programmes is specified in NDP9, and DTVET, FCTVE, and BOCODOL management expressed their support for the collaboration. A Memorandum of Understanding was drawn up, and a Key Skills by DE planning workshop developed a course specification. However, neither has made progress since the end of the TA project.

Conclusion

FCTVE is a highly resourced and well-provisioned college, especially in the context of developing African countries, but we have seen that providing access to the technology and skills is not enough. The policy framework is in place to support the introduction of flexible learning but this is clearly not enough to make it happen. There is a fissure – another chasm, perhaps –

between policy and the adapted organizational processes needed to bring about the changes specified in the policy.

The possible strategies for overcoming some of the challenges are both long- and short-term and are in the hands of both DTVET and the college. To ensure that the move towards flexible learning continues, focus is needed in key areas:

- leadership from college managers in the support of flexible learning;
- embedding of flexible delivery in individual performance development plans, departmental plans, and college strategic plans;
- adequate and appropriate human resource provision for flexible learning – there is a need for new roles in the college staff establishment;
- assistance to key officers at DTVET with responsibility for supporting BTEP delivery in colleges to engage more effectively with flexible delivery;
- more flexible policy and administration systems to facilitate flexible programme delivery;
- addressing of the key issue of staff utilization and how it is calculated when flexible learning methodologies are used;
- addressing of organisational culture issues (how-we-do-things-here); and
- identification and sharing of early success stories along with the identification of flexible learning champions.

Palmieri's experience in Australia shows that these are not simply issues for developing countries and although a one-size-fits-all approach is not advocated, it is clear that lessons can be learned from VET systems that have already made the move towards more flexible delivery. Palmieri's experience of national policy on utilisation of VET teachers is reflected at DTVET. Although the policy and policy-makers are clear about the need for flexibility, the management structures and systems have not been adapted to facilitate that flexibility. The words of Greville Rumble are echoed here, who says that flexible learning is more about the organization being flexible than the students (personal communication, 2006).

What is the future of flexible learning at FCTVE? This research is ongoing and lessons are still being learned from the process. It is hoped that more colleagues will cross the chasm and a foundation can be built for flexible learning at FCTVE that serves learners, teachers, and the Botswana VET system. It is also hoped that the chasm between the policy objective of flexible delivery and the management structures to support it can be reduced. The principal and a lecturer from FCTVE have the last word respectively.

Now that we have come so far with flexible learning, we want to do more. We've seen the successes and learned where we need to make changes, so we have started. We now need to consolidate what we have achieved and work with those people who have not yet come on board.

Moving to distance and e-learning should be treated as compulsory – teachers should not be given the choice whether to do it or not. Management should be strict and follow up and make sure everyone does it – that’s how it works with us Africans – we need to be made to do something before we can appreciate that it is a good idea.

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Book Review Editor

Terry Anderson
IRRODL Editor

IRRODL is very pleased to welcome Dr. Peter Cookson as book review editor. Long time IRRODL readers will remember Peter as the founding editor of IRRODL. Since leaving Athabasca, Peter has been working at universities in Costa Rica and Mexico. Recently, he accepted a position as director of Distance Education and Learning Technologies at Delaware State University. Peter has an extensive international background in all aspects of distance education and brings a wealth of experience and skills to the book review editor position.

As always, we are interested in both reviewers and books to review. If you wish to be considered as a reviewer, you are invited to register on the IRRODL OJS system as a reviewer. Please include the word *book* as well as your particular distance education interests. This will allow the book review editor to find interested reviewers. If you are selected and agree to review, a free copy of the book you review will be sent to you. If you are already a loyal IRRODL article reviewer, perhaps the arrival of a new book review editor will serve as a good excuse for you to update your profile in the IRRODL Open Journal System, including research interests and competencies.

Finally, if you are aware of a recently published book that you would like to see reviewed, please email Peter at peterscookson@gmail.com with the title, author, and publisher's name. We also encourage publishers to mail copies of books they would like to see reviewed to Brigitte McConkey, IRRODL managing editor, at bridgettem@athabascau.ca.



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Book Notes

Peter S. Cookson

IRRODL Book Review Editor

The three books reviewed in this issue of the journal reflect the cultural diversity of distance education as both a field of study and a field of practice. Olaf Zawacki Richter of the Fernuniversität, Germany, reviewed the book edited by Mohamed Ally of Athabasca University, Canada, that presents theory, research, and practice relating to experiences with mobile learning in North America, Europe, and South Africa. Nataly Tcherepashenets of Empire State College reviewed two books, *Online Communication in Language Learning and Teaching*, authored by Marie-Noëlle Lamy and Regine Hampel of the British Open University, and *Telecollaborative Language Learning*, edited by Melinda Dooly of the *Universitat Autònoma de Barcelona*. Both books provide insights, based on theory, research, and practice, about the nexus between communication competence, intercultural collaboration, language teaching, and online distance education. David Brigham of Empire State College reviewed the book, *China's Radio & TV Universities and The British Open University: A Comparative Study*, written by Runfang Wei of the Radio & TV University in Nanjin, China. This Chinese distance education scholar sets the stage for her comparative review by describing how the theories of Charles Wedemeyer, Michael Moore, Borje Holmberg, and Otto Peters have shaped the development of the global practice of distance education. She then reviews the different historical and theoretical antecedents that presaged the British Open University and China's Radio & TV Universities. Collectively, the authors of the books reviewed in this issue of *IRRODL* demonstrate the rich intercultural and intellectual diversity of our field.



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Book Review

China's Radio & TV Universities and the British Open University: A Comparative Study

Author: Wei Runfang (2008). *China's Radio & TV Universities and the British Open University: A Comparative Study*. Yilin Press: Nanjin, China. ISBN 978-7-5447-0803-6

Reviewer: David Brigham, State University of New York, Empire State College

As an experienced administrator of distance learning, I found myself drawn to this book by its title, *China's Radio & TV Universities and the British Open University: A Comparative Study*. Although I was quite familiar with the British Open University (OU), and I had heard of China's Radio & Television Universities (RTVUs), I wondered why the names of these two apparently disparate institutions would appear in a book title, much less be the object of a comparative study. What was the author's purpose? What did one institution have to do with the other? And what could I learn from this book that would help me improve my professional practice?

The book's author, Wei Runfang, said that she wrote this book to answer the following question, "How can distance education, the invention of the western developed countries, work within different political, economic, social and cultural contexts" (p.1). This book addresses the question by examining the similarities and differences between the OU and China's RTVUs within the political, economic, and cultural context of each country. In the introduction to her book, Runfang hopes that the study will help others who are attempting to transplant distance education from western developed countries and that it will contribute to the development of distance education theory.

I found the most interesting aspect of this book to be its international perspective on distance education. Chapter 1 begins with a whirlwind tour of the global practice of distance education by outlining its development in Europe, the Americas, Asia, Oceania, and Africa. This international perspective sets the stage for the remaining chapters by taking readers outside their country-specific perspectives of distance education to view distance education issues and practices on a global scale with the accompanying political, economic, and cultural diversity that entails. Chapter 1 concludes with an overview of four widely recognized definitions and theories of distance education: Charles Wedemeyer's theory of independent study, Borje Holmberg's theory of guided didactic conversation, Michael Moore's theory of autonomy and distance, and Otto Peters' theory of industrialization of teaching. The author points out that these theorists are practitioners and researchers working in western developed countries (Wedemeyer and Moore in

the United States, Homberg in Sweden, and Peters in Germany) and therefore their theories “might be based on and be constrained within their personal experiences of the teaching and research in the context of developed countries.” She then suggests that “the future evolution and development of distance education theory might need a more global perspective” (p. 32). These comments intrigued me. I wondered what aspects of distance education theory might need to change to accommodate a “global perspective” and what a global perspective would look like.

Following the overview, the book includes four chapters comparing the OU and RTVUs in terms of their establishment, structure, and teaching and learning models. These chapters present the core content of the book including an explanation of the link between the establishment of the OU in 1969 and the establishment of the RTVUs in 1979. The author explains that while on a trip to China in early 1977, former British Prime Minister Heath (1970-1974) described the OU model to Chinese leader Deng Xiaoping. The ensuing conversations provided the impetus for establishing the RTVUs in China (p. 45).

On the whole the author does a credible job of tracing the trends in each country that led to the establishment and development of the OU and RTVUs. This book presents a detailed account of how each institution came into being and was influenced along the way by political, economic, technological, and cultural factors and trends. In Great Britain these trends included the rise of adult education, the growth in educational broadcasting, and the desire for egalitarianism in education (p.47). In China the RTVUs were primarily driven by the urgent need for nation building. Therefore, the RTVUs were structured around serving the needs of the country rather than the needs of the individual (p. 62). Those who want or need to find out the details about the establishment and development of the OU and/or the RTVUs within the cultural traditions of each country will find them here.

The book of nearly 400 pages is packed with information and could be a difficult read were it not for several features aiding the reader. These features include a section listing over four pages of abbreviations and acronyms, concise chapter summaries, and a well-developed index. As a result, readers with specific information needs on a topic large or small will be able to satisfy that need quickly.

I will conclude by saying that for me, the value in reading this book lies mainly in the international perspective it provides. Before reading this book, I had not thought of distance education as embodying the cultural concepts of western developed countries. I suppose I had naively thought of distance education as culturally neutral. However, through this study the author has shown that western concepts such as learner autonomy, independence, and individualism are very much a part of the theory and practice of distance education and that they do not easily transplant to eastern countries. While I would like to have learned more about how distance education theory and practice might be altered by a global perspective, I was pleased that this book provided me with new questions to ponder.



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Book Review

Online Communication in Language Learning and Teaching and Telecollaborative Language Learning

Authors: Marie-Noëlle Lamy and Regine Hampel (2007). *Online Communication in Language Learning and Teaching*. New York: Palgrave Macmillan. ISBN 978-0230-00127-5

Editor: Melinda Dooly (2008). *Telecollaborative Language Learning*. Bern: Peter Lang Publishing Group. ISBN 978-3-03911-523-5

Reviewer: Nataly Tcherepashenets, State University of New York, Empire State College

As an area coordinator for online foreign languages courses, I am constantly seeking efficient, innovative strategies for teaching languages and cultures, which in my mind are closely connected to the task of increasing students' multicultural awareness. I was delighted to find that Marie-Noëlle Lamy and Regine Hampel, British scholars and practitioners of distance learning and the authors of *Online Communication in Language Learning and Teaching* and, especially, Melinda Dooly, the Spanish-based teacher trainer and researcher and the editor of *Telecollaborative Language Learning*, share this vision. Both books focus on the communication aspects of language learning/teaching from two complementary perspectives and relate the development of communication skills to the fostering of intercultural competence.

Lamy and Hampel are interested in computer-mediated communication (CMC) and have chosen to discuss it in the context of language learning (CMCL). Dooly et al. produced their work as a "guidebook moderating intercultural collaboration online" based on an innovative project they conducted.

Online Communication is divided into four parts: Key Concepts and Issues, Research and Practice, Practitioner Research, and Resources. Each chapter in the first part (chapters 1-7) begins with the exploration of concepts in relation to computer-mediated communication (CMC) and gradually narrows its focus to language learning. This strategy makes the book of interest to both readers who teach languages and to beginning researchers in CMC across disciplines. At the end of each chapter, there is a summary and lists of recommended texts in both the field of CMCL and in related areas. The dual reading lists perceptively emphasize the intrinsically interdisciplinary nature of CMC research.

Chapter 1 offers an historical overview of the emergence and development of CMCL and delineates current research needs in such areas as assessment and teaching delivery. The authors also point out the emergence of a new content area for research, intercultural theory, which is particularly relevant in the context of foreign language learning.

In chapter 2, the authors compare and contrast two theoretical frameworks, which have shaped research in second language acquisition: cognitive and socio-cultural theories. They suggest that socio-cultural theory, which stresses social interaction for learning, has the dominant influence on intercultural theory and on the most recent studies in CMCL in general.

In chapter 3, some of the key concepts of socio-cultural theory, such as mediation, multimodality, and multiliteracies, are discussed in relation to such issues as collaborative learning, production and transformation of knowledge, and learners' motivation and anxiety.

The authors observe that research in CMCL is oscillating between two poles of quantitative and qualitative research, and they outline two major directions of inquiry in chapter 4. First, there is comparative research, which can be approached from either a quantitative or qualitative point of view. Second, there are two related but distinct methodologies: discourse analysis and conversational analysis. The authors criticize the comparative approach for its inaccuracy in comparing CMCL with face-to-face experience. The difficulty and unreliability of comparative research, in their opinion, is due to the fact that in both face-to-face and virtual classrooms the same learners rarely talk about the same topics for the same reason. One may not necessarily agree with this observation because goals and even syllabi for online and face-to-face language classes are usually similar; therefore, outcomes might be comparable.

Further, in spite of the critique, the authors occasionally engage in comparative analysis, as, for instance, when they move on to a discussion of identity research, which deals with one of the most debated notions in face-to-face learning theory. Adopting Jay Lemke's definition of identity as "performance," Lamy and Hampel point out an emergent interest in identity formation, expression, and development in the virtual environment as well as in the much debated link between identity and "interculturalism" in CMCL. They observe that research findings are not unanimous in identifying such features as increased tolerance for otherness or "weaker cultural barriers in operation" in distance-learning environments, and they emphasize the importance of further research on "the ecology of online learning" and especially on the sites of learners' (inter)cultural development in a virtual foreign language classroom.

Chapter 5 covers pedagogical issues. The authors focus on the roles and skills that are needed by a competent online instructor. They stress the importance of encouraging online group bonding, especially important in language learning where the emphasis is communication. They advocate teaching online through collaboration. They share a vision of the instructor as a facilitator, and they also advocate the autonomy of the learner. According to Lamy and Hampel, the language research community has not been well-represented in the whole field of practice and research that has developed around the term *computer-supported collaborative learning* (CSCL).

Whereas in chapter 5 the authors mainly discuss teaching through a collaborative and task-based approach, the focus of chapter 6 is on learners. They point out the benefits and the inhibitory effects of CMCL on a learner's experience, giving most attention to such factors as participation, anxiety, motivation, learner control, and autonomy.

Chapter 7 addresses the question of assessment of CMCL. The authors provide a useful critical overview of current studies, and they identify further research needs in such areas as assessment of intercultural learning, feedback and error correction policies, criterion specification, silent participation, self- and peer assessment, and e-literacy.

Part 2 (chapters 8-13) aims to bridge research and practice. After pointing out a mutually enriching relationship between theory and practice, the authors note that sometimes practice invites a broader theoretical base, as, for example, in research on international telecollaborative projects that in addition to the familiar issues of language learning has opened up psychological and semiotic considerations of identity and meaning-making online.

In order to address questions of formation of identity and meaning-making online, in chapters 8 through 12, the authors introduce two complementary perspectives on technological tools, represented through the lenses of two specific studies. These tools include asynchronous fora, synchronous chat, multiple object-oriented environments, audiographic environments and virtual worlds, and video conferencing, as well as blogs, wikis, and mobile devices.

Structured differently, chapter 13 presents an overview of such emerging technologies as blogs, wikis, and mobile devices, illustrating some possibilities for specific applications in the context of foreign language learning. The authors emphasize that both institutional and cultural factors play a role in the successful use of these technologies in virtual classrooms.

Part 3 (chapters 14-17), entitled Practitioner Research, is, as expected, addressed to those who are interested in carrying out research with their students. The authors suggest that three organizing principles, i.e., reviewing practice, designing and implementing action, and evaluating and possibly disseminating findings, lie at the base of such research. They provide convincing examples of how these principles have been used. Finally, they offer a brief overview of methods and instruments that can be complemented by reference to online resources that are the focus of chapter 18. In addition to providing useful sources, the authors outline possible practitioner research projects.

Dooly's guidebook, *Telecollaborative Language Learning*, exemplifies an observation that empirical findings enrich research as much as research applications can be beneficial for practice. Contributors to this volume offer insightful reflections on aspects of online language pedagogy derived from a specific experience of participation in the international telecollaborative language learning project entitled Moderating Intercultural Collaboration and Language Learning. I was delighted to discover that, as the title of the project indicates, the authors explicitly relate language learning to the development of intercultural communicative competence (ICC).

The assumption behind this project, and that informs the present study, is that group diversity can contribute positively to the learning process. The authors suggest that cultural dimensions of the learning process can have a crucial influence on the outcomes. They may be highlighted or even become a point of conflict when collaborative learning involves culturally different learners. The authors of chapter 1 introduce the concept of intercultural communicative competence. Most theories agree that it consists of intercultural sensitivity (willingness to respect and accept differences and similarities), intercultural awareness (understanding of cultural conventions that affect thinking and behavior), and intercultural adroitness (behavioral aspect, development of skills needed to act effectively in situations that involve intercultural interactions).

The authors of chapter 2 introduce helpful tips for teaching ICC, which in their opinion can be developed through at least five different models: (1) the cognitive model, where the emphasis is on intellectual understanding of a culture; (2) the self-awareness model, where the emphasis is on raising awareness and on identifying the attitudes and opinions embedded in students' own culture (cultural values); (3) the cultural awareness model, which aims at getting students to recognize and better understand aspects of culture that are universal and others that are specific to certain cultures; (4) the simulation model, which places students in a simulated cultural environment so they might learn to adopt new habits and attitudes towards the target culture; and (5) the interaction model (immersion model).

Chapter 3 presents tools that help to facilitate collaborative learning and the integration of multiculturalism in the foreign language virtual classroom. I especially liked the discussion of blogs as a collaborative tool because they are usually considered to be useful for more individualized projects, such as a reflective journal or as a type of portfolio. This chapter ends with reference to specific helpful ideas for efficient teaching with blogs, wikis, and webquests.

Instructors as well as students benefit from collaborative learning. The authors of chapter 4 focus on teacher education and suggest that collaborative learning projects in an educational portal, comprising such resources and services as e-mail, forums, and search engines, can allow teachers and students to design their own "virtual content."

In her concluding chapter, Dooly highlights the development of intercultural awareness and the main elements of effective online peer collaboration for the purpose of foreign language acquisition. This chapter contains useful tips for assessment strategies that students can apply to their own and to their peers' work. The book ends with an idea bank in three major areas: "getting started," "implementing your project," and "ideas about assessing." Some specific suggestions are valuable for future developers of collaborative projects as well as for practitioners and researchers who are looking for innovative ways to infuse multicultural competence in a virtual language classroom.

In summary, students and beginning researchers who are interested in computer-mediated communication and those who approach this field from the perspective of foreign language acquisition will benefit from the theoretical discussions, the outlines of current research needs,

and the practical observations that the authors of *Online Communications in Language Learning and Teaching* offer. More seasoned practitioners and researchers, especially those puzzled by the task of integrating multiculturalism in a foreign language virtual classroom, will find *Telecollaborative Language Learning* to be a good companion, full of creative and fresh ideas.

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Book Review

Mobile Learning: Transforming the Delivery of Education and Training

Editor: Mohamed Ally (2009). *Mobile Learning: Transforming the Delivery of Education and Training*. Athabasca, AB: Athabasca University Press. CDN\$39.95 ISBN 978-1-897425-43-5 (297 pages)

Reviewer: Olaf Zawacki-Richter, FernUniversität in Hagen, Germany

Mobile Learning: Transforming the Delivery of Education and Training, edited by Mohamed Ally from the Centre for Distance Education at Athabasca University, is published in the Issues in Distance Education Series of AU Press. The book comprises three parts with 13 chapters. Part 1 deals with theoretical foundations and provides an overview of the current state of mobile learning (two chapters). Part 2 includes four chapters that report on research into mobile learning, and part 3 presents various examples of the application of mobile learning in different contexts and subject areas (seven chapters). At the end of the book the reader finds an index and a helpful glossary with technical terms.

I must admit that I was always a bit sceptical about the development and relevance of mobile learning, although I was involved in a mobile learning workshop for Nokia as early as 2001. What is the added value of mobile learning? E-learning is learning at home or at the workplace, so is mobile learning just learning in between? Well, what convinced me was a research visit to South Africa and the enormous opportunities that wireless devices afford to provide access to education and learner support, especially in developing countries. Africa is obviously leapfrogging from an unwired, (almost) non-existent e-learning infrastructure to a wireless e-learning infrastructure (Brown, 2004; Zawacki-Richter, Brown, & Delpont, 2008). Mohamed Ally emphasises this important aspect of mobile learning in his introduction as well.

The first chapter, Current State of Mobile Learning, contributed by John Traxler, was previously published in *The International Review of Research in Open and Distance Learning* in 2007 (8, 2). He sets the stage by defining mobile learning in contrast to e-learning and makes the point that learning with mobile devices is more flexible, spontaneous, and ubiquitous and can be more personalised, situated, and authentic than “tethered e-learning.”

In chapter 2, Maguerite Koole presents a theoretical model for the development of mobile devices, the design of learning materials, and the design of teaching and learning activities called

the framework for the rational analysis of mobile education (FRAME). This comprehensive model covers different aspects of mobile learning, including the device, usability, and learner characteristics as well as social aspects of interaction via mobile devices.

The second part of the book contains research papers on mobile learning and begins with a chapter by Torstein Rekkedal and Aleksander Dye entitled Mobile Distance Learning with PDAs. It reports on experiences from the development, testing, and evaluation of mobile learning at NKI (Norwegian Knowledge Institute) Distance Education, funded by three European Union projects. It is interesting for the reader to follow the whole development from the first prototype course to the integration of mobile learning into mainstream provision at NKI. However, it is a pity that this chapter was not updated for this volume after its first publication in *IRRODL* in 2007 when the final project (Incorporation of Mobile Learning into Mainstream Education and Training) was only in its early stages.

Chapter 4, Using Mobile Learning to Enhance the Quality of Nursing Practice in Education, by Richard F. Kenny, Caroline Park, Jocelyne M. C. van Neste-Kenny, Pamela A. Burton, and Jan Meiers, draws upon Koole's FRAME model. After a literature review on the application of mobile learning in health care and nursing, they present an exploratory evaluation of a pilot project with two instructors and three volunteer students. They conclude that the use of mobile learning is especially feasible in supporting informal learning of health care professionals. This chapter was also originally published in *IRRODL* in 2007.

In chapter 5, Gill Clough, Ann C. Jones, Patrick McAndrew, and Eileen Scanlon conducted a survey to explore the various ways in which PDA and smartphone users exploit mobile device services to support their informal learning ($N = 200$). A full range of intentional and unintentional learning activities is described in this chapter.

In chapter 6, Kristine Peters investigates mobile learning in corporate settings. She carried out 29 interviews with manufacturers of mobile devices (4), individuals from corporations (6), and educational providers (19). Despite the opportunities and benefits of mobile learning, Peters finds only limited adoption of mobile devices for education and training and describes the impeding factors.

Chapter 7 complements chapter 5. Agnes Kukulska-Hulme and John Pettit sent out an instrument to students and alumni from the Master in Online and Distance Education at the Open University UK ($N = 75$) to investigate personal mobile device usage. They triangulated the results of nine interviews with individuals who showed interesting and intensive usage behaviour. The authors distinguish between five types of activities with mobile phones, smartphones, PDAs, and MP3 players: teaching, learning, work, social interaction, and entertainment. Interestingly, 30% of respondents use mobile phones for teaching and 17% for their own learning.

Chapter 8, written by Claire Bradley, Richard Haynes, John Cook, Tom Boyle, and Carl Smith, is a valuable resource for those who are or will be engaged in the design and development of multimedia material for mobile phones. The authors describe in great detail the iterative

development of four prototypes of multimedia objects for learning study skills informed by a formative evaluation process.

The following chapters present various applications of mobile learning in different contexts and subject areas. They draw on extensive practical experiences, reflect on a number of conceptual models, and describe best practices in mobile learning. Michelle Pieri and Davide Diamantini (chapter 9) evaluate a training course for managers in a blended m-learning format ($N = 15$). Laura Naismith and M. Paul Smith (chapter 12) report on a project in which a multimedia tour for museum learning was developed, and they discuss its design based on the feedback of 25 visitors. Chapters 10 and 11 deal with projects, programmes, and courses in developing countries. Merryl Ford and Teemu Leinonen present an international project that promotes mobile learning for schools in South Africa trying to use low-cost technology. Jon Gregson and Dolf Jordaan go on with a case study of a mobile learning project for students in a postgraduate distance learning programme for students from the Southern African Development Community (SADC) region. They describe the challenges of providing access and support to students in developing countries and offer possible solutions. In the final chapter, Jocely Wishart describes a small-scale project for teacher training. Trainee teachers used mobile devices to record observations on each others' lessons, student behaviour, etc.

In his conclusion, Mohamed Ally lists the lessons learned from the contributions to this book as well as the challenges for educators and institutions to develop learning materials for mobile devices and to integrate them into mainstream delivery.

By and large, the research and development projects presented here are based on quite a small numbers of students, which suggests that mobile learning is still in project status and has not yet reached the mainstream. Large scale empirical studies on the design, impact, and effectiveness of mobile learning seem to be rare still. Some chapters in this book were already written in 2006, which is a long time ago given the rapidly developing field of mobile learning.

That being said, the editor is to be commended for this fine selection of papers that demonstrate best practice and explore the various applications and opportunities that mobile learning affords. This volume is a valuable resource for educators, trainers, and researchers alike.

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Technical Evaluation Report

68. The Global Internet Pandemic

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Abstract

The global rise of Internet-based education is discussed in relation to models drawn from social studies and epidemiology. Experiential and data density models are highlighted, also the capacity for technological change, and phenomena observed in the spread of disease. The lesson of these illustrations is that even apparently permanent phenomena can be transient and that current online practices may rapidly be superseded by other technologies regardless of their apparent success. It is hoped that these illustrations will help to prepare distance educators for the technological, social, and economic changes that could naturally affect their future work, particularly at times of economic crisis.

Introduction

Traditionally, teaching-learning theory and practice have been developed and interpreted in the 'hot houses' of higher education. Homogeneous solutions are based on defined constructs that determine the need for change and that contain predictive capabilities. In the new century, the accepted teaching-learning methodologies have exploded into a globalised panorama of constantly changing requirements when teachers and learners wish to update their knowledge, learning, and teaching practices. Constructivist approaches represent teachers and learners as peers, rather than according to the traditional hierarchical model by which knowledge was transmitted from teacher to learner. In current online education, knowledge and personal experience tend to be shared and analysed through discussion, democratic in the sense that everyone is expected to take the time to listen, inquire, reflect, and respond to each other's suggestions. Individual learning paths are designed, implemented, and encouraged by the group members; and enthusiastic attempts are currently being made to apply these methods globally.

Globalisation, however, requires cooperation and a unified effort to reinforce economic, cultural, technological, social, and environmental constructs. The current economic recession, for example, needs concerted action by all nations, regardless of their political stances, and plans for new opportunities to increase each member's potential. The process involves maintaining

individual identities and working in harmony, so the concerted result will be greater than the sum of the individual contributions. Global collaborations combatting threats of disease, from HIV-AIDS to the recent swine flu, illustrate this process.

The Spreads of Knowledge and Disease

In dealing with a new disease, a prime strategy is to isolate the population that exhibits signs of the disease in order to protect the larger population from its effects. Experts determine if the disease is contained in isolated subgroups and argue that their main priority is to protect the larger population rather than to promote research into longer-term solutions. This strategy tends not to lead to curative measures, however. Since the 1980s, such an approach has been argued to have contributed to, rather than resolved, the AIDS epidemic (UNAIDS, 2008a), and an estimated 33 million adults and children now live with HIV globally (UNAIDS, 2008b). A comparable situation can be observed in relation to the spread of the Internet-based educational techniques of the last decade. In developing countries particularly, the dissemination of these online techniques has not always been in the general public interest.

The analogy between the emergence of the educational Internet and the treatment of a disease outbreak begins with the isolation of teaching-learning communities. These are encouraged by dissatisfaction in the existing teaching-learning models and by motivation to develop new pedagogical models involving analysis, innovation, collaboration, and teamwork. In the excitement of the development process, the assumption is made that global connectivity has effectively redefined educational boundaries in terms of Internet access rather than physical presence. With ubiquitous access, a non-homogeneous distributed network is envisaged in which teachers and learners join a learning community to construct knowledge and to develop their understanding of diversity through interaction. In building educational consensus, new opportunities for teacher-learner and learner-learner interaction are encouraged (Lavin, Beaufait, & Tomei, 2008), and the assumption is made that cooperation and collaboration enhance academic performance in a wide range of multicultural environments. Communal learning assumes the inherent potential of linguistic capital and background knowledge in the teaching-learning context (Pountney, Parr, & Wittaker, 2002).

However, ubiquitous Internet accessibility has not yet been realised in any country, least of all in the developing world, owing to varying population densities, disabilities, literacy, and limited resources; and online learning continues to maintain its reputation in the general public as a poor substitute for classroom learning (Crichton & Childs, 2008). It will be argued that when attempts are made to implement an online approach via cooperation, collaboration, and communally shared constructs, the multifaceted, globalised tapestry of educational choices and consequences can rapidly unravel. The online effort to share knowledge itself may be threatened, especially in a situation of economic crisis.

In the ODL community, this pessimistic scenario gains relatively little attention, although it emerges in isolated papers and case studies. Garber (2004), for example, described the natural process of development and decay of virtual communities; and Cleal (2009) reports the

frustrations of students required to use a graphic-based virtual environment (Second Life) for activities they regard as mere play. Meanwhile, online educational methodology is actively being encouraged in developing countries with little or no apparent concern for the lack of infrastructure and for problems of cultural and technological diversity (Baggaley & Ng, 2005). In these situations, the use of Internet methods may prove to be short-lived, and the uncritical transfer of Internet-based educational practices from developed to developing countries is likely to create a pandemic of problems, requiring urgent paradigm change.

Educational Paradigm Shifts

For knowledge paradigms to change and adjust successfully, critical thinking tools are required: evaluation, classification, and hypothesis development. Choices based on criteria become more important than the mere sourcing of facts in the evolution of global communities (Brookfield, 1995; Ornstein, 2003). The educational and economic challenges of the early 21st century include the urgency of meeting immediate needs, predicting future events in the global market, addressing multicultural and intergenerational diversity, and sustaining technological and knowledge paradigm shifts. Added to this complexity are three interacting factors that delineate the lasting impact of any transition, changing the “form of social organisation, the character of the economic system, and the capacity for communication” (Raskin et al., 2008). The three factors are *experiential density*, *data density*, and *constant technology change*, each underlying the educational paradigm shifts related to Internet usage.

Experiential Density

Virtual communication develops reciprocity and cooperation through multimedia and virtual worlds. Collaborators respect diverse talents and thought processes while exercising personal control of what, where, and how web content is constructed, without the necessity of privilege, payment, or role hierarchy (Prensky, 2001). The effectiveness of this virtual space is driven by the end-users rather than by governments or institutions (Addison, 2006). Such teaching-learning communities are grounded in social constructivist theory, supporting communities of practice in which the identity and agency (presence) of each participant is recognised, and in a community created by the grouping of the participants (co-presence). Learners, teachers, and leaders engage in this broader community of practice, and each participant potentially experiences a variety of roles while learning from each other (Anderson, 2003, 2008).

The virtual community process is analogous to that of physical population settlement. In the 21st century, traditional settlement, with strong binding collectives and common cultural standards, has been replaced by urban housing projects, generating a pluralist society and new forms of individualisation. These multicultural projects tend to be loosely organised, and mobile family units can move through the communities at unsettling rates (Hirst & Thompson, 1999). The process involves a level of experiential density relating to the density level of the members’ experience in physical and recreational environments. Andereck & Becker (1995) described this phenomenon in the context of cruise ships – an apt metaphor for the Internet experience of the modern online traveler. New technologies create new experiential densities for users in a

collaborative web community of shared browser applications, resources, and skills. For digital immigrants, navigation through virtual settlements requires an adjustment of thought and actions analogous to the experiences of newly arrived immigrants in traditional settlements (Prensky, 2001). Web-based social networks move users from real time to Internet time and can create loosely organised global connections with a mouse click (Gozzi, Jr., 2002). In these dynamic environments, opportunities exist to learn, gather information, and chat with colleagues (Rovai, 2007); but the milieus can be chaotic, with physical cues lost in a virtual world that requires its members to depend on unreliable prompts for a sense of scale, direction, or location (Krug, 2006).

Data Density

As educational institutions shift from teacher-centred transmission models to learner-centred constructivist models, the inquiry-based focus of knowledge gathering creates a collaborative collective of teacher and learners (Colburn, 2000). Wesch (2008) regards this practice as “anti-teaching,” in which learners’ needs become as significant as pre-planned curricular outcomes and faculty members’ teaching perspectives. This position argues that one should not dismiss the importance of the teaching practice in the new paradigm. In the teaching-learning environment, for instance, learners may understand Google procedures, but if they are dependent on their own assessment skills alone, they may find the information they generate too densely packed to comprehend and the answers they locate difficult to understand. In this situation of data density, the learner requires the expertise and support of a classroom teacher, subject specialist, or librarian to sort and synthesise the data from an artificially generated dump to a credible intellectual artifact capable of furthering research and scholarship.

Past success does not predict future solvency in a global economy, therefore. The challenge of creating educational policies in a transnational economic market is to succeed in educating the public regardless of power relations, ethnicity diversity, and generational differences. Adapting the deficit model or deprivation model to a virtual situation, the migrants to an online community can become viewed as a drain on resources and as rivals in a competitive ‘glocal’ (*sic*) market, rather than as active contributors to the community (Rumbaut, 1997; Sarroub, 2008). The general attitude becomes negative, disempowering, and divisive (Steyn, 2008) as these reflexive cultural reactions diminish any community’s success.

Capacity for Communication and Technology Change

Internet-based virtual classes have undoubtedly improved many aspects of educational communications and have been cost-effective in reaching many segments of the global learning and teaching audience (Rumble, 2001). Traditional universities are developing useful hybrid methods and dual modes based on Internet ubiquity (Shale, 2002); and organised sources of knowledge are being adopted that go far beyond the walls of traditional libraries and print-based journals to include virtual resources containing a wide range of new contextual, cultural, and experiential information.

Many components of the online experience diminish these successes, however, including poor course design and delivery techniques and inappropriate institutional modes, knowledge sources, and management systems (Moore & Kearsley, 2005). As argued above, new educational technologies have affected both the form of social organisation and the character of economic systems in terms of experiential and data density. As Internet technology becomes increasingly pervasive and as new educational approaches involving social networking become increasingly popular, the previous 'gold standard' of excellence, computer literacy, may become impossible to define. Attempting to remain current, users may come to associate the constant need to update their computer hardware and skills with emotional upheaval (Kay, 2008). In an environment of rapid change, technology continually dictates deadlines, obligations, and costs; and solutions are not always as flexible, fast, and fluid as previously. Educators and policy-makers face the increasing costs of infrastructure with dwindling resources. A situation is created in which data are simply 'pushed' into communication channels, while communication itself is not necessarily improved. In large populations particularly, the technology is maximised while human contact is minimised, and isolation and psychological distance are amplified.

Conclusions

A holistic view of knowledge and skill acquisition is developing in the 21st century, with the goal of allowing improved remediation and lifelong learning. To make this possible, an integrated, aligned, and shared infrastructure is required between teachers, learners, and employers. These alignment functions include personalised learning and negotiated outcomes with shared services and costs. In theory, the system can provide efficient supply and demand, with enriched styles of research and scholarship responding effectively to the individual's situation. Although current shifts in the teaching-learning paradigm seem to support economic initiatives, the increasing vocationalism of education may create a closed accreditation system that impedes the utilitarian concept of global education (Grubb & Lazerson, 2006). Governing bodies overseeing certification within national and provincial boundaries can further ensure this elitist attitude. Examples of higher education faculties currently supporting such practices include education, nursing, and social work.

The Internet can prolong and strengthen relationships, which in turn can affect other aspects of the system for better and for worse. Critics resistant to online education in society are weakening the viability of Internet-based methodology as surely as online enthusiasts are arguing its merits. Ultimately such resistance, whether defined by low connectivity, reliability, or learner retention, will be a key factor in determining the online system's success and survival; and when the political moment arrives at which the Internet is no longer regarded as an educational panacea, the good works of its advocates will carry little weight. While successful educational initiatives in one country or region can certainly be replicated in others, failures to replicate are equally probable. Just as a medical cure may become more injurious than helpful for particular classes of patient, so the global potential of the Internet may diminish as global communities, developed and developing, become increasingly isolated by it.

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