CHAPTER 1

Background to the Study

> *"ICT has the potential not only to improve education, but also to empower people, strengthen governance, open up new markets and galvanize our efforts to achieve the Millennium Development Goals".*

—Kofi Annan (2004)

1.1   Introduction

It is widely believed that integrating emerging technology with traditional face-to-face teaching practices can have a positive impact on education and training because technology has the potential to maximise student engagement with the tutor, rich learning resources, peers, and external experts. It can also extend access to higher education (HE) which is a significant advantage especially as a way of addressing increasing financial constraints in HE without compromising the quality of education and training. As a result, a progressive trend is emerging in many Universities around the world towards the use of new technologies and associated pedagogies in their teaching and learning in order to achieve a new level of efficiency and effectiveness. In fact, it is not only in the HE landscape, in several countries, information and communications technology (ICT) is being used at School level also. *eSchool News* (2009) reports, "Beginning this fall, third and sixth graders throughout San Diego will use laptop computers to connect with their peers and work on projects that apply what they're learning to real-world situations."

This study is about utilising the affordances and opportunities offered by ICT to re-engineer the nature of the educational practices at the University of Botswana (UB) where instruction is delivered mainly by traditional face-to-face approaches. This chapter discusses the global pressures on HE systems for the adoption of ICT in their teaching and learning, and its impact on UB, thus establishing the rationale for this study. Further, it highlights the purpose of the study, thus coming up with an appropriate research question. It also discusses related ingredients (such as an overview of research methodology and design, philosophical assumptions of the study, significance of the study and limitations of the study) to make the study successful.

1.2 The Global Pressure on Higher Education for ICT Adoption and its Impact

Educators within institutions of higher education are faced with the rise of information society and new technologies, the increasing diversity of students, new educational institutions, the increasing emphasis on learning over teaching, and the emergence of postmodern ways of knowing (Austin, 2002).

Globalisation, the knowledge explosion and technological advancements are exerting a profound influence on HE institutions around the world. Globalisation is a real challenge for HE; on the one hand, it is a driver for international competition, and on the other hand, it is leading to new and rich forms of collaboration (institutional, interpersonal and intercultural), where ICT is one of the key drivers.

The phenomenal growth of the Internet, and the World Wide Web (WWW), the emergence of Web 2.0[1] online social networking technologies and the speed at which young people are now embracing these interactive technologies are all a challenge to the status quo in the HE practices as well as an opportunity to educators. These challenges and affordances of technology put huge pressure on educators and instructional designers to seriously rethink the role of emerging technologies in instruction, and even to redefine HE curriculum in the context of today's unprecedented advances in communications technology because in order to ensure that today's youths graduate with the skills necessary to fully participate in the information society and the emerging global knowledge economy, a new kind of teaching and learning is inevitable.

As a result, the HE landscape is in a constant state of flux and evolution, mainly as a result of other significant challenges arising from:

(i) increasing demand for quality HE, dwindling budgets for HE, and the subsequent need for alternative instructional delivery modes to provide increased educational opportunities to more students, and

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[1] *The term Web 2.0 was coined in 2004 to describe a shift towards new ways of using the web as a platform for tools and services that have an emphasis on user participation and interaction. Now the use of social networking sites, blogs, wikis, instant messaging, Secondlife, social bookmarking and media sharing have become widespread. The existence of such online applications and services as MySpace, Skype, Facebook and YouTube are well known in the private lives of most people today. However, using Web 2.0 for learning is more about particular methods and approaches to teaching than introducing a new set of technologies and tools. Thus, this is not about technology for technology's sake and we need to use technology when it is effective and appropriate to do so. (see Blogs, wikis and official statistics: New perspectives on the use of Web 2.0 by statistical offices, at http://www.unece.org/oes/nutshell/2009/11_Stats.pdf)*

(ii) changing learning preferences and needs of the net generation 'Generation Y'[2] students as a result of new and emerging interactive technologies and pedagogies, and the increased flexibility in their acquisition of (new) knowledge and competencies.

Many educators believe that technology has the potential to solve many of the pressures associated with the societal change in attitude and delivery of education (Franklin and Peat, 2001). As a result, technology is having a dramatic effect on colleges and universities, producing what may be the most challenging period in the history of higher education (Oblinger, Barone, and Hawkins, 2001). UNESCO's "Policy Paper for Change and Development in Higher Education" urges higher education institutions to make greater use of the advantages offered by the advancements of communication technologies so that "each university should become an "open" university offering possibilities for distance learning and learning in various points in time (Moore and Tait, 2002, p.88).

The Internet and the World Wide Web (WWW) have evolved into a global workspace for collaboration. H. M. Deitel, P. J. Deitel, and Nieto (2001) explains that the Internet mixes computing and communication technologies. Together, they have made possible a wide range of teaching and learning innovations associated with accessing educational opportunities and information. It makes it possible to integrate different types of content and systems, contributing to innovations in education, facilitating a variety of mixed modes of classroom-based and online learning. Eklund, Garrett, Ryan, and Harvey (1996) find that the WWW is significantly less expensive to produce materials electronically than in printed form, and the material may easily be kept up to date. It is also being seen more and more as an effective means of delivering courses in the tertiary education sector. Online learning was the first step in the process of providing increased access and convenience to students. In addition, the Internet has caused a power shift in classrooms, as learners now have greater access to information sources, experts, and peer learners. Valuable educational resources from many institutions (such as MIT's OCW, OpenLearn, Open Yale, Johns Hopkins OCW, and others) are now freely accessible over the Internet.

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[2] *Generation Y, people born after 1977, make up around one fifth of the world population and grew up with the Internet, instant messaging, YouTube and Facebook. They are technology-savvy, start browsing the Internet before they are five years old, and find their friends online. (see What Is a Millennial? at http://www.bnet.com/2403-13059_23-201716.html)*

The educational potential of the Internet and the WWW in addressing the afore-mentioned HE challenges is attracting the attention of tertiary educational institutions worldwide. Higher educational institutions are increasingly moving towards the use of the Internet for delivery of their courses, both on campus and at a distance (Ally, 2004; Kim and Bonk, 2006). Dunn (2000) projected certain changes in higher education's landscape over the next 20 years: "The number of degree-granting institutions will continue to grow, while the number of traditional campuses will decline. By 2025, half of today's existing independent colleges will be closed, merged, or significantly altered in mission" (p. 37).

Many Universities around the world are now accommodating new technologies to meet the burgeoning demand for HE. The use of ICT for dissemination of education is believed to have huge potential for governments struggling to meet a growing demand for education while facing an escalating shortage of teachers (UNESCO, 2007) and the economy in recession.

Skills such as global literacy, computer literacy, problem solving, critical thinking, creativity, and innovation have become critical in today's increasingly interconnected workforce and society, and technology is a catalyst for bringing these changes into the classroom. The International Society for Technology in Education (ISTE, 2000a) defined successful schools as those that provide integrated technology experiences for their students to:

> ➢ Increase their technology capabilities;
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> ➢ Seek, analyze and evaluate new information;
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> ➢ Become problem-solvers and decision-makers;
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> ➢ Use tools creatively and effectively to assist them in decisions;
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> ➢ Become communicators, collaborators, publishers, and producers.

These are part of the core competencies that one should have acquired to remain competitive and even survive in today's information age. As a result of all these, the traditional notions that teachers are the sole custodians of knowledge, that any content expert can teach, and that students have to go to Universities to acquire knowledge have been seriously challenged. One of the most powerful promise of technologies is its ability to capture knowledge that can be easily searched, reused, and shared with

others, thus developing a spiral of new knowledge creation. Because of the above mentioned benefits, many universities are making every possible effort to introduce the latest technologies to their campuses in order to improve student learning and extend it beyond the classroom. Wegerif (2007) emphasises that education, as we have known it, will have to change as more and more of us rely on internet search engines, such as Google, to look things up and find things out.

Although the discussions are around the use of new technologies in learning environments, a progressive trend is emerging in many Universities around the world under an undisputed vogue of blended learning or hybrid instruction that focuses on the use of new technologies and associated pedagogies in their learning and teaching environments in order to achieve a new level of efficiency and effectiveness, and to meet institutional goals. Extant literature indicates that the web-based blended learning approach can effectively meet the demands raised through the above cited forces of change. Godambe, Picciano, and Schweber (2004) report that many faculty are using the blended design to take advantage of the best pedagogical techniques of online and face-to-face learning. The hybrid instructional learning model is one of the fastest growing delivery modes in HE.

To sum up, there is unprecedented pressure on educational systems around the world to adopt ICT to enhance the delivery of education. As indicated in the literature review, the use of instructional technology in HE has increased substantially over the past several years. Most institutions within Sub-Saharan Africa are beginning to explore the possibility of adopting this mode of learning to help address the ever-growing demand for tertiary education within the sub region (UNESCO, 2007). This trend continues even in the midst of the current economic recession and several technology-related constraints that include limited internet access, poor bandwidth and inadequate infrastructure.

Although the use of technology in HE is exciting and beguiling, there are quite a number of challenges in its proper implementation, due to a complex set of factors such as technological, organisational and pedagogical. Education is not a simple task, and educational systems are complex and notoriously resistant to change. Adding to this is the emphasis by some HE managements to show quantitative results in what is inherently a qualitative experience. Lack of an elearning policy that is embedded in its

institutional culture is another problem with some institutions; further, if the policies are not aligned with the conditions necessary for the adoption of educational technology[3], the education system might continue to be traditional.

1.2.1 Botswana education context [4]

The Botswana Government has already recognised the need for cost effective and sustainable means for educating and training its peoples in order to remain competitive in national and international economic, technological and human resource sectors. At the core of Botswana's education policy is the goal of providing accessible, equitable, quality, relevant and lifelong education and training.

As a result of the substantial investments made in the education sector, there has been a huge increase in the number of schools in the Botswana since its independence in 1966. From a mere 250 primary schools and nine secondary schools then, there were 786 primary schools and 271 secondary schools (including both junior and senior schools) by 2008. In addition to these, there a number of private schools also. Currently there is 100 percent access to primary education and 100 percent transition rate from primary to junior secondary schools. Transition from junior to senior schools was only about 67 percent by 2008 and is a challenge.

Transition to tertiary education is a major challenge facing the nation though there has been substantial improvement in the recent past; it has increased by 40 percent over the period from 2003/04 to 2008/09.

A recent 'Needs Analysis Study' conducted by a UB-appointed Consultancy Service led by Professor Tony Dodds (Dodds, Gaskell, and Mills, 2008) identified three main potential groups of people whose educational demands cannot be satisfactorily met by traditional Universities largely due to varied reasons, some of which are:

(i) Form 5 school leavers qualified for entry into tertiary education but not admitted to existing programmes. There is an accumulation of this category,

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[3] The international Association for Educational Communications and Technology (AECT) based in Bloomington Indiana defines educational technology as the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources (Januszewski and Molenda, 2008). Educational technology is not a tool: it is a *practice* for creating conducive learning environments to facilitate student learning and improve performance using technological processes and resources.

[4] Data adapted from 'Botswana Review', 29th edition (2010), B and T Directories (Pty) Ltd., 'Needs Analysis Study' by Tony Dodds (2008), and 'Towards a knowledge society' by Tertiary Education Council (2006).

in thousands, and will build up in the next ten to twelve years. This group is expected to reach 16000 by the year 2021.

(ii) Working adults requiring tertiary qualifications for their career advancement. Four main potential audiences were identified under this category:

    a) Teachers (with expected demand of 15,000 in 2012-2020);

    b) Nurses/para-medics (with expected demand of 5000 in 2012-2020);

    c) Civil servants in other professions (with expected demand of 10,000 in 2012-2020);

    d) Private sector workers (with expected demand of 10,000 in 2012-2020).

Undoubtedly, lifelong learning is becoming a competitive necessity of the workforce in the Information Age and it will require periodic training (and retraining) supplemented by post-training support especially in some specialised areas. In such circumstances, Cetron (2005) argues that the opportunity for training is becoming one of the most desirable benefits any job can offer, and employers are coming to view employee training as a good investment (p. 6).

(iii) The many thousands of young women who may have adequate qualifications for entry into tertiary education but have not had the opportunity to do so either due to lack of places or other social reasons or commitments, such as bringing up families. The career ambitions of the increasing number of these young women cannot arguably be met through existing traditional programmes.

The Government is committed to increase access, enhance relevance, ensure quality and maintain diversity of choice in tertiary education, and to address these in line with Vision 2016 and national development plan goals and objectives, it has formulated a new Tertiary Education Policy: *Towards a knowledge society* (2006). A key objective in the new policy is to achieve a gross enrolment ratio (GER) of 17% in tertiary education by 2016 and 25% by 2026. Currently the GER - the ratio of 18 to 25-year-olds enrolled in tertiary education - is estimated to be 11.4%. This is to be achieved through the expansion of tertiary education through expanding UB, developing a second public university and other tertiary institutions in the private sector.

As a result, the HE landscape in Botswana is faced with significant challenges to provide education and lifelong learning opportunities to a wider audience by *whatever* means that work best. The good news is that the Botswana Government is taking several steps to address these challenges.

Technology-supported flexible modes of delivery seem to be an effective means for reaching people in the above mentioned categories. However, ICT-supported delivery may not be feasible at this time in some areas in Botswana where electricity and the internet are not available. It is evident from the literature that if universities are to remain competitive and even survive, they must make use of emerging technologies in their delivery in order to serve a larger population of students from different backgrounds and age groups, and to provide them with meaningful and rewarding learning experiences. This is particularly true in the context of UB as it is currently the only public University in Botswana, and there is a huge demand for HE in the country.

1.2.2   *Higher Education Landscape in Botswana*[5]

Given the importance of the role of education particularly HE in turning a nation's economy around, HE is widely perceived in Botswana as central for social transformation and sustainable economic development and is in consonance with the UN proclamation of the 'Decade of Education for Sustainable Development, 2005- 2014' (DESD) 'emphasizing that education is an indispensable element for achieving sustainable development' (Bonn Declaration, 2009). In today's complex and rapidly changing global society, HE has a major role in contributing towards a country's overall development. As Rury (1996) suggested, the university should become society's unique site where students learn how to think, learn, produce, and evaluate knowledge, providing the basis for lifelong, independent learning. An important implication of this is the need for a re-thinking of the purpose of HE. This requires recommitment to creating an ideal learning environment for students and employing new pedagogies and technologies, where appropriate.

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[5] Data adapted from 'Botswana Review', 29th edition (2010), B and T Directories (Pty) Ltd., 'Needs Analysis Study' by Tony Dodds (2008), and 'Towards a knowledge society' by Tertiary Education Council (2006).

Currently University of Botswana (UB) is the only national public university in Botswana. It offers a range of learning, social, cultural and recreational opportunities that focus on unlocking the huge potential of each and every student for academic excellence and personal growth. However, it cannot accommodate all eligible school leavers from about 28 public and 48 privately owned senior secondary schools across Botswana.

Government is continuing to expand tertiary education by adding a new Faculty of Health sciences and a new Medical School to UB, by developing another public university—the Botswana International University of Science and Technology (BIUST)—which is expected to be in full operation from the 2010/11 academic year, and by encouraging a number of private institutions to operate in the country through accreditation by the Tertiary Education Council (TEC)[6]. Thus, the private sector also plays a significant role in educating the Nation. They are six such institutions that include:

- ✓ Limkokwing University of Creative Technology with headquarters in Malaysia and a branch in Gaborone;

- ✓ NIIT, based in India, with branches in Gaborone and Francistown;

- ✓ New Era College;

- ✓ Gaborone Institute of Professional Studies (GIPS)

- ✓ ABM University College in Francistown; and

- ✓ Ba Isago University College with branches in Gaborone and Francistown.

Some of these schools offer diploma and degree programmes while others offer vocational education and training also. These private institutions are licensed and are regulated by the national Tertiary Education Council.

In addition to these, there are six teacher-training colleges at diploma levels and three technical colleges, all funded by the Government. Other vocational training and non-formal education run by private sector for youth out of school are also available. All vocational training centres are regulated for quality by a Government Agency called the Botswana Training Authority (BOTA).

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[6] *TEC is responsible for the coordination of tertiary education and for the determination and maintenance of standards of teaching, examination and research in tertiary institutions in Botswana.*

Botswana has a generous state-sponsored financial assistance programme to eligible citizen students in the form of bursaries and loans through the 'Student Placement and Welfare' Department of the MoE. Full bursaries are provided only to students in critical skills shortage areas. Most of the beneficiaries are being educated in local private institutions in Botswana, but many students are sent abroad such as other SADC countries, Europe, USA, Australia, and Canada to study in specialist areas. 26,943 tertiary students were sponsored in 2004, with 17,932 at local institutions and a further 9,011 being sent for training outside the country. In 2007, total access to tertiary education through placement of students in other colleges and tertiary institutions locally and internationally was 35 000. Most of these external students pursue ICT-related courses. The Ministry of Education and Skills Development gets the largest budget for any single ministry. On top of this, a special allocation of P 915 million was given to this ministry in 2008/09 to augment funds for post secondary school bursaries. All these efforts indicate Government's commitment to support tertiary education.

1.3 UB Context: A Brief Historical Background

UB was incepted in 1964 as part of the University of Basutoland, Bechuanaland and Swaziland (UBBS) which was a tri-nation consortium. Its name was changed to the University of Botswana, Lesotho and Swaziland (UBLS) with the independence of Botswana and Lesotho in 1966,. Though UBLS was equally funded by these three countries, it had comparatively little physical presence in Botswana until a small Short-Course Centre was set up in 1969. Lesotho pulled out in 1975 and established its own university- National University of Lesotho (NUL); Botswana and Swaziland continued as the University of Botswana and Swaziland (UBS) until 1982 when Botswana Government established UB by an Act of Parliament. Today UB is one of the best resourced and staffed universities within the Sub-Saharan Africa. It has the main campus located on a 115 hectare site in the capital city of Gaborone and two satellite centres located in Francistown and Maun.

1.3.1   The status and role of UB in the national development process

UB is funded by the Botswana Government through its Ministry of Education (MoE), yet it has a high degree of autonomy. MoE subsidy to UB was around 12% of MoE expenditure for 2000/01. However, being the only University in the country it is highly attached to the Government and its policies, and thus, they are mutually dependent. This dependence is normal in the sense that the common notion of universities as independent institutions is changing in most countries for various reasons. UB's response to the national aspirations as espoused in its national document *Vision 2016: Towards Prosperity for All* (1997), especially in building an educated, informed, prosperous, productive, and innovative nation, form the basis for the development of most of its programmes.

UB represents an important educational investment by the Nation, and as a result Batswana (people of Botswana) have great expectations in terms of acquiring relevant skills to prosper and survive in a changing world that is being continually shaped and reshaped by scientific and technological innovations, globalisation, cross-cultural encounters and changes in economic, political and social dynamics. In order to keep pace with rapid social and technological changes, and to be in line with international trends in curriculum development, UB provides relevant, demand driven rather than supply driven, academic programmes of high quality that are based on innovative educational processes and the application of appropriate technologies.

To meet these expectations and its own goals, UB engages in improving the quality and expanding the quantity of the human capital needed for development, and acts as a repository of the collective intellectual wealth of the nation and the world. The first of these functions is fulfilled through various teaching programmes at different levels. The second function is undertaken individually and collectively by the UB staff through their research, consultancies and community services.

1.3.2   UB: Vision and Mission

UB is a key instrument in the fulfilment of Botswana Government's aspirations towards building an *educated, informed, prosperous, productive and innovative* nation. This is well articulated in UB's Vision and Mission (UB homepage, 2004b).

UB's Vision: The University of Botswana will be a leading centre of academic excellence in Africa and the world.

UB's Mission: To advance the intellectual and human resource capacity of the nation and the international community.

UB will fulfil its Vision and Mission by:

(i)   **Offering** quality academic and professional programmes that ensure a commitment to and a mastery of life-long learning skills as well as encouraging a spirit of critical enquiry;

(ii)   **Developing** a student-centred, intellectually stimulating and technologically advanced teaching, learning and research environment;

(iii)   **Producing** graduates who are independent, confident, self directed, critical thinkers, professionally competent, reflective practitioners, innovative, socially responsible and thereby marketable and competitive nationally and internationally;

(iv)   **Advancing** scholarship and generating research through the discovery, integration, dissemination and application of knowledge;

(v)   **Serving** as an intellectual and cultural centre that draws upon the nation's indigenous knowledge base and which promotes Botswana's social and cultural heritage as well as being a community resource for new ideas, partnerships, and collaborative effort;

(vi)   **Providing** leadership in responding to the nation's cultural, economic, political scientific, social, technological and industrial needs and contributing to the qualitative development of Botswana's HE system;

(vii)   **Extending** access to HE through the utilisation of information and communication technologies, within the framework of life-long and open learning;

(viii) **Recruiting** and developing quality staff and students, recognising and valuing the essential contribution they make, as well as rewarding excellence in the work they perform;

(ix) **Promoting** the health, social, and spiritual welfare of the University community through a range of policies and programmes and a diversity of positive co-curricular activities and experiences;

(x) **Enhancing** the teaching, learning and research environment through the provision of a proactive style of leadership and management and efficient, effective and quality driven institutional support services.

The Mission and Vision of the University give strong impetus to transform its academic processes towards an increasingly technological base. As it is stated in its official document entitled, *Shaping Our Future: UB's Strategic Priorities and Action* (2004), the vision of the University is to strive for excellence in the provision of education to the nation that includes the use of ICTs in the teaching-learning process. The six strategic priority areas are:

(i) Expanding access and participation;

(ii) Strengthening engagement;

(iii) Improving student experience;

(iv) Providing relevant and high quality programmes;

(v) Intensifying research programmes;

(vi) Enhancing human resources for excellence in delivery.

In addition, UB is currently aspiring to transform itself into a technologically-driven University in order to expand access, participation, engagement and student experience based on its strategic priority areas. Accordingly, the UB Management is currently pondering over the question, "what must UB do to be a technologically-driven university, distinguished by its efficient application of IT to its academic work and its administrative business processes?" (Email, Prof. Youngman, DVC-AA, March 06, 2010).

In view of the above reasons, UB is continually pursuant of fostering an intellectually stimulating, technologically-driven learning-centred environment where students are

encouraged to demonstrate critical enquiry and independent thought, and to become self-directed and independent graduates who are competent professionals and responsible citizens.

1.4   The Nature of Instructional Delivery at UB

UB has been a purely traditional university where the conventional face-to-face approach was the main mode of delivery. However, since 1991 with the establishment of CCE, it has become a dual university meaning that it has now both on-campus as well as distance learners.

The academic year at UB consists of two 14-week semesters. The first semester runs from early August to mid-December, and the second semester from mid-January until May. It offers Diploma, Bachelor's, Master's and Doctoral programmes in a number of disciplines through the six faculties and its Centre for Continuing Education (CCE). In addition to these programmes, UB also offers:

- ➢ A 'Study Abroad' programme that allows International students who are enrolled as degree candidates in an accredited College or University to study at UB for six months to a year, whilst gaining credit towards their home degree.

- ➢ A 'Student Exchange' programme for students whose university has an exchange agreement with UB.

- ➢ Academic collaboration in teaching and research with other reputed universities. On February 20, 2008 UB and the Missouri University of Science and Technology (MUST) in the US signed a Memorandum of Agreement to establish a program of academic and scientific cooperation in mining engineering whereby students who have done three years study at UB will undertake their last two years of study at MUST leading to the award of a Bachelor of Science Degree in Mining Engineering by MUST.

A review of the UB Vision and Mission indicates that UB has recognised the educational potential of ICT and is committed to its use in developing a student-centred, intellectually stimulating, and technologically advanced teaching, learning, and research environment, and extending access to education even to non-

conventional learners within the framework of life-long and open learning (University of Botswana, 2004). This commitment is carried out by its 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 to extend access to higher education through the utilization of ICTs within the framework of lifelong and open learning opportunities. 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 (CCE). Considerable progress is being made with a substantial number of courses 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.

1.4.1   *Learning and Teaching Strategies*

UB expects its academics to adopt learning and teaching strategies that are in line with its Vision and Mission. It is based on these, that the UB 'Learning and Teaching Philosophy' (2008) was formulated. The policy is based on the principle of "intentional learning", which puts emphasis on pedagogical strategies that encourage active learning, the achievement of learning outcomes and the development of self-directed, independent learners who have learned how to learn. This is in contrast to content-oriented teaching strategies that focus primarily on "covering the material" and passive learning. To facilitate the shift in the kinds of learning its students need, UB encourages academics to create positive learning environments that suit all students to learn at their own pace, become lifelong learners and acquire appropriate graduate attributes for living, working and managing change.

The University of Botswana and the nation at large had long recognised the importance of embracing technology in the delivery of its programmes and there is no doubt in what the envisaged benefits were in terms of the kind of student, and role that student should play in the knowledge economy[7] (UB Shaping our Future, 2004). This was in line with its vision objectives of "developing a student-centred, …

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[7] *Economy developed on the foundation of information, learning and adaptation. The comparative advantage in such an economy is the ability to learn faster than one's competitors.*

intellectually stimulating and technologically advanced Teaching Learning and Research environment" and "extending access to HE through the utilisation of ICTs, within the framework of life-long and open learning". As a result, UB introduced the WebCT™ learning management system (LMS) in 2001 in order to promote the use of elearning[8] for on-campus students as well as its distance learners. The distance learners are enrolled through its Centre for Continuing Education (CCE) and have very minimal face-to-face contact but are adequately supported with other modes of delivery such as print, elearning, audio and videoconferencing. More information on the use of WebCT™ is provided in Section 1.51 and 2.8.1.1.

1.4.1.1 UB Graduate Attributes

The Learning and Teaching Policy of UB provides a list of learning outcomes as the attributes that the learners should have acquired on successful completion of a programme at UB (Item No. 4, UB Learning and Teaching Policy, 2008). The envisaged graduate attributes are:

- ➢ ICT knowledge and skills

- ➢ Self-directed, lifelong learning skills

- ➢ Critical and creative thinking skills

- ➢ Problem-solving skills

- ➢ Communication skills

- ➢ Entrepreneurship and employability skills

- ➢ Organisational and teamwork skills

- ➢ Research skills and information literacy

- ➢ Social responsibility and leadership skills

- ➢ Interpersonal skills

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[8] *The term 'elearning' is increasingly used as an umbrella term to describe terms such as 'networked learning', 'online learning', and computer-assisted learning'. Definitions of elearning in the literature are diverse; however, there is general consensus that elearning in some way involves the use of Internet communication technologies to enhance and/or support learning activities.*
One common definition is: Elearning is the use of information and communications technology (ICT) to deliver education, monitor learner performance, and report learner progress.

➢ Cross-cultural fluency

➢ Accountability and ethical standards

All UB academic programmes are required to integrate all these graduate attributes into curriculum design and assessment. This integration has pedagogical implications in so far as it represents a change in epistemological emphasis from "knowing that" to "knowing how" or "learning to learn" and a need to apply knowledge in new social contexts. This changed view of the nature of knowledge acquisition and application of knowledge demands new teaching and assessment approaches and is meant to enhance graduate employability (UB, 2009) to help learners to be more effective in the workplace and be of benefit to themselves, their employers and the wider economy. All in all, this set of attributes is in line with UB's role as the key agent in the fulfilment of Botswana Government's aspirations about HE towards building an educated, informed, prosperous, productive and innovative nation (Botswana Government, 1997).

1.5   Elearning infrastructure and support available at UB

Since 2001, UB has been investing significantly in building technology infrastructure and other related resources in order to promote the use of ICT in supporting and facilitating successful and quality learning experience for all its students. The LASO[9] model for technological transformation in tertiary education (Uys, 2000) was used to guide the technology implementation and selection of appropriate strategies. It highlights the importance of top-down, bottom-up and inside-out strategies for technology implementation to be successful. Leadership is achieved through mechanisms such as defining a clear vision for technology integration, providing a reward structure for those engaging in the change process, and creating of a strategic framework to guide the implementation process. Bottom-up strategies include ownership and readiness for change on the part of learners and academic staff, and these can be achieved by using strategies such as pilot projects, extensive training, establishment of workgroups and learning communities in every faculty, and use of teams for elearning courseware development.

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[9] Leadership, Academic and Student Ownership and Readiness

Even without any clear strategic plans and policies in place, UB went online in 2002 with the launching of a few online courses on the WebCT platform. Since then UB supports elearning through provisions of:

(i)   ICT infrastructure that includes an LMS-WebCT, Videoconferencing facilities, multimedia projectors, etc;

(ii)   training through workshops, and other appropriate programmes for lecturers and students aimed at developing their ICT skills;

Teachers are given basic ICT training as well as continual support in:

- ✓   course planning,

- ✓   instructional design,

- ✓   media production,

- ✓   online moderating,

- ✓   student support,

- ✓   course evaluation, and maintenance.

(iii)   *Advanced Elearning Certificate* workshop series which aim to develop elearning course development skills and to ensure sustainable development of elearning approaches;

(iv)   Electronic journals, e-books, electronic databases, and an extensive list of elearning books at the UB Library;

(v)   The UB elearning (UBeL) forum for teachers to exchange ideas, experiences and best practices. Launched in 2001, UBeL was a strategic approach meant to accelerate the integration of elearning into the curriculum of all faculties by the year 2004.

In addition to the WebCT Platform, UB also has the following technologies and related facilities available at UB:

➢ Smart Classrooms (six in number) with about 40 computers, multimedia projector and related technologies

➢ Video-conferencing (POLYCOM)

- eLearning Support Centre / Student Help Desk

- Technology-enhanced classrooms (50 in number) with

    - Data Projector (Ceiling-mounted)

    - Projection Screen

    - Desk Top Computer

    - Document Camera

    - Audio System

    - VCR/DVD Player

    - Podium

Support Service is provided by the ETU that comprises:

- A Deputy Director

- A Manager

- Two Instructional Designers

- A Media Developer

- A Graphic Designer

- Two Specialised Technicians

1.5.1 *Appropriateness of WebCT for the study*

The use of WebCT platform in this study is not by choice, but by default. This has been in use at UB since the year 2001. Amey and VanDerLinden (2003) note that Blackboard™ (WebCT) LMS has been used significantly to support the teaching and learning process in HE. According to Papasergiou (2005) LMS provides the potential for rich learning environments built on social constructivist theories and are available to all students, both on campus and those studying at a distance (pp. 593-622).

It can run virtual learning environments (VLE) and provide a single platform for content delivery, communication, social interaction and participation to actively engage students in educational processes, course evaluation and tracking factors such as student visits to VLE, student participation in online activities, and student

progress. For example, its discussion tool can engage students in reflective thinking, and support them to easily articulate and share ideas, ask questions, generate discussions and present individual discoveries in a non-threatening, supportive environment at a time of convenience, and better, at the time of thought. It was used in the study to deliver the online part of the blended approach. WebCT is an integrated LMS which has provision for students to interact synchronously and asynchronously with peers, tutors, and the learning material, and experience learning in multiple ways.

Notable features of WebCT include:

➢ It can support a student-centred flexible learning by offering flexibility in course presentation; it can support for a wide variety of content formats;

➢ It can facilitate personalized delivery to diverse student populations;

➢ It can accommodate a variety of learning styles and even accommodate those learning goals that require collaboration and discussion;

➢ It allows easy access to course materials and interactive tools both on campus as well as off campus;

➢ It enables the tutor to do quick updating of materials;

➢ It has detailed tracking and reporting capabilities;

➢ It provides an easy-to-use environment to teachers to develop courses using numerous user-friendly tools :

  ✓ Tools to manage users, roles, courses, instructors, and facilities and generate reports;

  ✓ Built-in course calendar for diarising important course events;

  ✓ Student messaging and notifications;

  ✓ Assessment/testing capable of handling student pre/post testing;

  ✓ Automated grading of assignments and assessments;

  ✓ Easy display of student grades/ scores;

  ✓ Web-based or blended course delivery;

✓ Grouping students according to their ability or topics for discussion;

✓ Selective release of materials based on individual needs;

✓ E-portfolio that presents a wide range of opportunities for students to store as well as share collections of their coursework with their peers, instructors, or others even outside of the WebCT environment.

Many of these features have been shown to create a greater sense of community and satisfaction, increase motivation, and improve learning (Regan and Knickerbocker, 2007; Woods, Badzinski, and Baker, 2007) through higher student engagement. The table below depicts the common learning needs and their affordances within the WebCT LMS.

Table 1.1: Learning needs and their affordances within the WebCT LMS

Learning Needs	Affordance
Announcement	➢ Regular one-way communication with students (e.g., welcome message for each class to enhance social presence); ➢ Keep learners up to date and involved;
Course information	➢ Posting general documentation about the course; ➢ Allows the attachment of word documents, e.g., module outline, schedule, assessment outlines;
Staff information	➢ Contact details; ➢ Office location, consultation times, etc. ; ➢ Personal background and pedagogical approach of the Instructor;
Course materials	➢ Posting of Overview/Advance organizer for each class; ➢ Learning activities, presentation files, and handouts for each class; ➢ Lecture notes provided to students as a scaffold for note-taking in the face-to-face class;
Assignments	➢ Reflection activities on the learning that has occurred; ➢ Weekly revision quizzes;
Assessment	➢ Development of quizzes and surveys that can be tracked by the teacher; ➢ Intermittent quizzes; ➢ Self-Assessment items; ➢ Student evaluation surveys;
Learning	➢ List of recommended books or chapter readings;

resources	
Communication	➢ Personalisation of learning ; ➢ Email to individual students, groups or entire class; ➢ Create chat rooms, whiteboard rooms, or combined chat and whiteboard rooms for groups to collaborate online; ➢ Group members can use chat rooms to engage in real-time conversations with other group members; ➢ Prompt rich feedback consistent with user expectations;
Discussion Board	➢ Whole class discussion forums (asynchronous); ➢ Writing activities; ➢ Critical thinking activities (e.g., evaluation, synthesis, multiple perspectives, etc.); ➢ Summaries of readings and peer feedback; ➢ Class presentations via PowerPoint and debates; ➢ Use of external websites, images, photos, video and audio to imitate and enhance student discussion; ➢ Non-class related discussion – area for general discussion to foster the development of a community atmosphere; ➢ Peer support network discussion forum allows students to provide feedback to each other (24/7); ➢ Student and tutor facilitation of discussion;
Groups	➢ Small group clustering for group projects and activities; ➢ Synchronous class discussion < 10 students; ➢ Personal reflective journals, field experience reflective journals and lecture reflective journals; ➢ Area allows discussion within groups, file exchange within group, email within group and synchronous communication within group; ➢ It has a tool called *Group Manager* that can help divide students within a class into several small groups; either teachers can assign students into groups or students can decide which group they want to join;
External Resources	➢ Links to online resources for enrichment as well as remediation;
Student tools	➢ Assignment submission to teacher; ➢ Creating a homepage.

Source: Adapted from IGI Global (2007)

However, it has to be noted that the use of LMS especially Blackboard/WebCT is not without criticism. The Researcher has noted with some concern that the rigid structure of WebCT and its imposition may not be appealing to the new generation of students

who are embracing personalized mobile technologies with high quality media capture devices and user-generated media like YouTube, Facebook, Wikipedia and Flickr which are now moving beyond the stationary PC onto mobile devices like iPhone and netbook computers. It is only natural for some of them to expect opportunities for making mobile social media integral to distributed learning environments. Thus, LMS brings an imbalance between student-led technology use and institution-led technology approaches.

Further, it has to be noted that the aim of developing a blended learning model is not tied to any particular LMS. It is totally platform independent; it may be used with OSSs such as Moodle and Sakai, and also with emerging mobile learning devices.

1.6   Progress made in technology innovation at UB

Currently, (May, 2008) 190 courses are using WebCT, out of which 159 are expected to supplement the on campus face-to-face approach and 31 for distance learners. This is just about 17% of the total courses offered at UB. In actual fact, most of these courses utilised technology for practising traditional approaches or rather to replicate face-to-face practices which has been a much-debated issue in the early days of technology adoption. Most lecturers simply uploaded their teaching notes on WebCT. The majority of academics are ill-prepared and unequipped to face such changes (Naidu and Steyn, 1999) from their long-embraced traditional practices to technology-supported virtual learning environments (VLE).

Although it is over six years into WebCT use at UB, the extent of UB-wide technology adoption and the quality of teaching and learning are yet to improve enough to realise economies of scale considering the huge investment on this LMS. These days HE administrators are looking for return on their investment (ROI) due to dwindling financial resources. In order to address these and other related challenges, there was a critical need to investigate and understand how the use of ICT could be improved in order to take advantage of its full educational potential by all students. Therefore, this study aims to move beyond the LASO approach and develop a complementary model in order to factor in pedagogical as well as design-based aspects such that it will help lecturers to adopt technology with the intention of making their practice more pedagogically effective.

1.7   Purpose of the Study

Today's students live in a global, knowledge-based age, and they deserve teachers whose practice embraces the best that technology can bring to learning. – Cheryl Lemke

Web-based learning is becoming an innovative solution to meet challenges arising from increasing demand for HE, decreasing budget for HE, increasing need for a broad range of information-rich online resources, and changing learning styles of today's so much interconnected net generation students. Today an increasing number of traditional HE institutions are utilising web-based approaches to enhance their students' typical learning needs that are critical in the 21st century that is characterised by a global knowledge economy. UB is no exception; as evident from its vision and mission as discussed under section 1.3.2 above, it is committed in:

➢ developing a student-centred, intellectually stimulating and technologically advanced teaching, learning and research environment, and

➢ extending access to HE through the utilisation of information and communication technologies, within the framework of life-long and open learning.

A critical examination of the envisaged graduate attributes listed under Section 1.4.1.1 above indicate high expectations towards the use of ICT-mediated learning and teaching environments because some of those attributes/ competencies and skills can be more effectively and efficiently acquired by students only in such technology-enhanced learning environments than in traditional lecture classrooms.

Although technology integration was introduced into the UB teaching and learning environment as early as 2001, the current state of technology adoption is far from expectations. What currently happens is largely 'putting the same old wine in new bottles'; most teachers use WebCT simply for 'posting' their course content online rather than for sound pedagogical purpose and obviously it cannot help learners in acquiring the graduate attributes and skills as required in the UB learning and teaching policy. With such instructional practices in the use of technologies, the focus is on knowledge recall rather than emphasising the social and situated nature of

learning that are considered critical in educating today's students who highly value social networking and interaction for all their communication and leisure purposes.

Technology creates new opportunities, but requires a shift in thinking in order to leverage its full potential, and to avoid the same pitfalls of past elearning approaches that just limited to just applying traditional learning approaches to new technology. It requires a closer look at the quality of instruction and instructional design in order to harness the educational potential of new technologies. The common challenges and mistakes are:

i) Educators in HE institutions are forced to adopt new technologies in their instructional approaches before they are adequately trained to align affordances of the tools to what they can offer for learning, and even without a clear pedagogical framework for attending to students' various needs; as a result, they engage in trial-and-error methods resulting more often in more errors than trials.

ii) Online course developers and tutors try to emulate the traditional classroom by giving more importance to delivery of content than to interactivity among learners and with the tutor;

iii) Even those who make use of technology-mediated interactions, often do it without utilising its potential for good pedagogy. This is particularly true in the UB context;

iv) Further, it is a constant problem to find a rational approach for implementing technology integration and improving its effectiveness in a given organisation because of several variables that may be vary from one organisation to another;

v) There are challenges to tutors from traditional face-to-face culture issues to design assessments aligned with a learner-centred instructional framework which considers both content and the skills used in the process of learning.

From the forgoing discussions, it is evident that there is a critical need to redesign or do a pedagogical re-engineering of teaching and learning environments at UB such that it can help address the nation's changing needs and aspirations, and achieve its vision "to become a leading centre of academic excellence in Africa and the world".

Currently, the international ranking of a university is decided by its web-presence which is a computerised assessment of the scholarly contents, visibility and impact of its web domain. Though the criteria used for this ranking is debatable, the need to adopt technology is not; based on the literature review around technology adoption in HE (Chapter 2), the way forward identified in this study is the Web-based blended learning approach as discussed in Section 2.4. However, there are several barriers to the implementation of blended learning environments as indicated above and also in Section 2.4.5. There is a pressing need, therefore, to provide practitioners with guidance on how to implement blended learning in their organizations. This in turn brings the need to conduct responsive research in order to find strategies for modelling and structuring blended learning environments.

Against this backdrop, the overall purpose of the study was to develop a web-based blended learning model[10] that would provide students learning opportunities that are more student-centred, interactive, and engaging than it is normally possible in a face-to-face-only classroom, and that are accessible to students beyond the traditional fixed teaching schedules. The affordance of technology to facilitate learner-centredness and virtual learning environments (VLE) accorded the blended approach a constructivist perspective. Learner-centredness is a concept derived from constructivism.

1.8   Research Question

Within the context of the aspirations of UB, one of the strategies UB has identified to realise its Vision and Mission, is "developing a student-centred, intellectually stimulating and technologically advanced teaching, learning and research environment". The research question for this study is formulated as follows:

> *How can a web-based blended learning environment be designed,*
> *developed and implemented at the University of Botswana?*

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[10] *Models represent the broadest level of instructional practices and present a philosophical orientation to instruction. Models are used to select and to structure teaching strategies, methods, skills, and student activities for a particular instructional emphasis.*

The use of the term *environment* in the research question is intentional because according to contextual teaching and learning principles, the role of the instructor is *not* to provide only *learning content*, but is to provide the *authentic context* in which learning can occur. In this study the Researcher wants to consider teachers primarily as "designers of learning methods and environments to engage the learners in meaningful tasks" rather than primarily as "lecturers". In other words, the study aims to create web-based learning environments that are more personalized, user-friendly, and effective in supporting students in their learning process.

UB utilises WebCT as its LMS in delivering Web-based instruction. The research question guided the Researcher to identify the characteristics of technology-based student-centred learning environments based on review of relevant learning theories, pedagogical models, best practices in elearning and existing literature on instructional design approaches, and to develop a typical blended learning model that has these characteristics.

Specific Objectives of the Research

From the research question, the overall objective of the study is to bring emerging technologies into core teaching and learning at UB. In order to achieve this, specific objectives were formulated in clear, measurable and achievable terms. Thus the specific objectives of the study are given below:

(i)   To understand the strengths of ICT in HE context and the rationale of using it in teaching and learning in relation to conventional face-to-face instructional approaches, and to identify the way forward to realise these strengths; (Sections 2.1 - 2.3)

(ii)   To examine the distinct characteristics of web-based blended learning, how it is perceived, accepted and practised generally in HE and to justify the relevance of this approach in the study; (Sections 2.4.1 – 2.4.7)

(iii) To carry out an extensive review of pertinent learning theories and literature relating to the principles of instructional design and constructivist learning design that led to the design of blended learning environments; (Chapter 2, Section 2.7; Chapter 3)

(iv)   To examine the role of the leadership in managing the change associated with technology innovation and in providing appropriate infrastructure and support; (Section 3.14.1)

(v)   To distil theories, instructional/learning environment design principles/models and technology characteristics, and to synthesize pedagogical dimensions and design criteria for developing an effective blended learning environment; (Sections 2.9, 3.12, 5.2-5.7)

(vi)   To formulate a conceptual framework for a web-based blended learning[11] model, and further to design and develop the model; (Sections 5.8, 5.8.1, and 5.8.2; Tables 5.2 and 5.3);

(vii) To develop evaluation tools according to the conceptual framework and established benchmarks for best practice[12] in order to determine the effectiveness, usability and suitability to the UB context of the new model; (Sections, 3.5.6, 5.8.4, and 5.8.3.1)

(viii) To conduct a case study to test, improve and validate the new model by examining how it adheres to the criteria set in the evaluation tools referred to in (vii) above. (Chapter 6)

All in all, this study focussed on achieving each of these objectives and offering a practical approach to implement UB's vision for a technologically advanced student-centred learning and teaching environment.

1.9   Overview of Research Methodology and Design

The study used, by and large, a qualitative research method with a quantitative component. Statistical data from surveys was used as a descriptive measure. The reason for dominant qualitative approach is that, the nature of this technology innovation study is too complex to reduce to only quantifiable measures because the study focused on understanding or interpretation of meaning of the description of

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[11] *Throughout this work, the terms 'hybrid course' and 'blended learning' are used interchangeably; they refer to instruction that occurs both in the classroom and online, and where the online component becomes a natural extension of traditional classroom learning. The online component is provided through WebCT (Version 8.0) that utilises email, chat, and discussion forum as communication tools.*

[12] *The seven principle of good practice, as applied to web-based education, provide the framework for benchmarking these practices (Discussed in Section 3.5.6).*

experience verbalised by students during individual or focus group interviews and surveys. For example, through qualitative interviews it is much easier to evaluate how students could make up or compensate for the lack of personal contact in the online approach due to the common concern of 'facelessness' in online approach. Savenye and Robinson (1996) describe qualitative research as research devoted to *developing* an *understanding* of human systems (p. 1172). For the purposes of this research, '*understanding*' implies interpreting the experiences of students and teachers, while '*developing an understanding*' implies gaining knowledge from them about their experiences.

Typical characteristics of qualitative research (Bogdan and Biklen, 1992, p. 29-33) are as follows:

> ➢ Qualitative research is descriptive;
>
> ➢ Qualitative researchers are concerned with process rather than simply with outcomes and products;
>
> ➢ Qualitative researchers tend to analyse their data inductively;
>
> ➢ "Meaning" is of essential concern to the qualitative approach;
>
> ➢ Qualitative research has the natural setting as the direct source of data; and
>
> ➢ The researcher is the key instrument.

A descriptive and interpretive case study was chosen as a research strategy for this study to determine how the newly developed instructional model performed within its real-life context. The study only focussed on a single case study. According to Botha, van der Westhuizen, and de Swardt (2005), the most typical application of qualitative research in instructional technology seems to be that of case studies. In a descriptive and interpretive case study, the researcher analyses, interprets and theorises about the phenomenon against the backdrop of a theoretical framework. Further, the study reflects *particularistic*, *descriptive* and *heuristic* characteristics. It is particularistic because it focuses on a particular event. It is descriptive, as rich and thick descriptions were made of the data gathered. It has heuristic qualities, as the meanings that students attach to their experiences were discovered (Merriam 1998:27).

Merriam (1998) argues that case study is a type of qualitative research design that is particularly appropriate in the following instances:

➢ when one wants to advance a field's knowledge base;

➢ in applied fields such as education, in which the findings can improve upon existing practice;

➢ in studying educational innovations.

All these bulleted points are relevant in this study which included detailed, in-depth data collection that included multiple sources of information (observing, selecting, interviewing, analyzing and synthesizing information) from the context of implementation.

1.10   Philosophical Assumptions of the Study

Irrespective of whether quantitative or qualitative, all research is based on some underlying assumptions about what constitutes 'valid' research and which research methods are appropriate. In order to conduct qualitative research, it is therefore important to know what these assumptions are.

Based on the philosophical assumptions adopted, research can be classified as positivist, interpretive and critical (Gephart, 1999: [online]). These are fundamental orientations which are discernible in all intellectual domains. According to positivist approaches, the relationship between social reality and humans is independent, and has the role of determining laws of cause and effect. Positivists look for a single, objective meaning. Critical approaches analyse the ways in which social structures constrain and direct human actions. Critical theorists examine how our meanings get ideologically fixed into apparent unchangeability when, in fact, they are flexible and open to negotiation. They believe that people can consciously bring changes in their social and economic conditions.

Interpretative theorists look for subjective meanings which is uncovered as they are negotiated with others. According to Walsham (1993) Interpretivists uphold the notion that knowledge of reality is gained only through social constructions such as language, shared meanings, tools, documents, etc. They believe that phenomena must be clarified and understood in the social contexts in which they are constructed

through social activities. The philosophical assumptions underlying this research come from an interpretive tradition. More information is provided in Section 4.2: Research Paradigm.

1.11   The Trustworthiness of the Study

Qualitative researchers use the term *trustworthiness* of the research to refer to and to ensure the quality of the research findings. In the design of a qualitative study, the analysis of the results, and the judgment of the quality of research, the most important issue is trustworthiness (Creswell, 1998). The trustworthiness of qualitative research can be established by using four strategies: credibility, transferability, dependability and conformability (Krefting, 1991; Lincoln and Guba, 1985), and are constructed parallel to the conventional criteria of internal and external validity, reliability and neutrality (Krefting, 1991). In general, the use of multiple data collection methods contributes to the trustworthiness of the data, and this practice is commonly called triangulation. As mentioned by Leedy and Omrod (2001), using two or more approaches enables us to learn more about the world than when we are limited to only one approach. The triangulation strategy is designed to strengthen the knowledge claims of the study. To further ensure trustworthiness in the study member checks, peer reviews, dense descriptions, immersion/ crystallisation and investigator triangulation were employed. This is further discussed in Chapter 4: Research Methodology and Design.

1.12   Significance of the Study

The study led to the development of a working model for creating web-based blended learning environments at UB which is in line with UB's Vision and Mission. It is hoped that the findings and the derived model would encourage lecturers at UB to rethink their traditional teaching practices, and to consider using ICT to support student learning beyond the classroom and even outside the campus.

Blended approaches to delivery helps in addressing the six strategic priority areas of UB (Section 1.3.2) and is quite significant as UB is the only public University in Botswana. It also resonates well with the call for collective efforts aimed at achieving

the EFA[13] goals, adopted at the World Education Forum (Dakar, Senegal, April 2000) which require that the learning needs of all young people and adults are met through equitable access to appropriate learning and life-skills programmes and through harnessing ICT to help attain those goals.

Blended learning approach might be instrumental in taking UB's learning and teaching environment to new heights in the near future because the literature indicates that for students with demanding schedules, and institutions with physical space constraints, web-based blended learning is the most sought after delivery mode in higher education today (see section 2.4.6). The online part has a role in achieving the learner-centred approach envisaged in this study as it can enhance tutor-learner dialogue, formative assessment strategies and a community of practice (CoP) approach whereby the focus is on learning rather than teaching. This view is consistent with that of Barr and Tagg (1995) who emphasised the need for a shift of focus in higher education from one of providing instruction (the teaching paradigm) to one of producing learning (the learning paradigm).

By and large, the study contributes towards how best ICT can be utilized in achieving the ambitions and aspirations of Botswana, especially in building up an educated and informed nation and thus, in fulfilling its commitment to create a *prosperous, productive and innovative* nation, as reflected in the National Vision 2016 (Botswana Government, 1997). To the best of the Researcher's knowledge, this work is the first of its kind.

Although the findings cannot be used for sweeping generalisation to other HE institutions per se, it leads the innovation curve on tapping the potential of ICT in HE; it has created the foundation for what is possible with emerging technology in HE today. As technology continues to advance, instructional options will expand to an extent when we will be able to run courses fully online (without concerns over the current issue of feeling of isolation in elearning). The study generates an innovative, pedagogical learning and teaching framework for technology integration into a traditional HE context and makes an original contribution to the field of educational technology within the landscape of HE.

Being the only and leading university in Botswana, UB has a leadership role for the

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[13] Education for All

next public university which is currently in its gestation period. The new university will have high expectations from UB as a role model and will look for best practices to emulate. Therefore, it is imperative for UB to be sufficiently informed and reformed with an effective and efficient learning and teaching environment. It is also critical for UB to stand the possible competition, and to continue holding its status as a leading HE institution in Botswana.

Furthermore, it is hoped that the model developed through this study will help to empower all stakeholders (administrators, instructional designers, teachers, and students) to initiate and adopt technology change and innovation, and to sustain it in the UB learning and teaching culture.

1.13   Limitations of the Study

The study confines to the context of UB where about 17% of academics use WebCT tools mostly as an add-on to the conventional face-to-face approach. Being a case study, certain variables such as the organisational culture, individuals, conditions, resources and market are unique to this case. As a result, this study cannot be generalised to other institutions. However, the findings may be used applicable to other institutions which operate in similar situations as UB in which case it could be adapted by such institutions after suitable modifications. From constructivist point of view, Cunningham (Willis, 1994) claim that it is impossible to produce "findings" that are generalisable across all possible circumstances.

The foundation of this study is simply based on practices and anecdotal evidences that ICT-supported environments create opportunities for effective learning and help to develop a wide range of skills necessary to live and prosper in the information age that is driven by knowledge-based economy. For example, an Australian Government report entitled, *Learning for life - final report: Review of higher education financing and policy*, (West, 1998: 59), states that "technology will revolutionise higher education". Therefore, it is just an educated guess in this study that thoughtful and appropriate use of ICT can enhance learning outcomes that are relevant for today's information society that is characterised by knowledge economy. Again, it is assumed that the UB academics have common consensus on the positive impact of ICT on teaching and learning in HE.

Further, the focus of this study is to design, develop and deliver a course for classroom to be used at undergraduate level. Transforming delivery of all courses and programmes at UB into hybrid instructional environments (UB-wide technology integration) widely, requires massive changes to the organisational context, and educational setting as a whole; the requirements may include a shared vision for technology integration, new pedagogical approach, tutor development programmes, hybrid (re)design faculty development program, sound institutional implementation plan, adequate technology infrastructure, technical support, evaluation processes and organisational change management strategies. Elearning brings change, and is disruptive for most educators. The Researcher agrees with Mantyla (2001), "change is never easy…. it is best to take one step at a time. You should not try to do or understand everything at once." It is my conviction that once it has been successfully done with one class, it can be better marketed and gradually extended to the whole UB, provided other related elements are addressed appropriately and there exists a strong digital leadership as discussed in Section 3.13.1.

1.14   Ethical Considerations

Any research study raises ethical issues that need to be considered and addressed as an integral part of the planning and implementation process. This being a qualitative study, the Researcher interacted closely with the participants and the tutor, thus entering their personal privacy to collect data. Understandably, this raises certain ethical issues that should be addressed during, and after the research had been conducted. Therefore, appropriate steps were taken in this study to adhere to the ethical guidelines. This is discussed in more detail in Chapter 4.

1.15   Chapter division

The dissertation has been divided into seven chapters, references, and appendices.

Chapter 1: Background to the Study

This chapter provided a general overview of the study. It includes a brief background to and context of this study, pressure on HE for ICT adoption moving from the global to the local situation in trying to put the issues in correct perspective, the purpose of

the study, the research question, an overview of the research methodology, and significance as well as limitations of the study.

Chapter 2: Theoretical framework and Literature review

The chapter discusses the scope of new and emerging technology in HE from various perspectives, impact of new technologies on the characteristics of HE students, opportunities for new ways of student learning through the use of ICT, and the perceived acceptance of blended learning as a model of delivery in HE. Subsequently, a theoretical framework was formulated with a view to adopting web-based blended learning as a new approach to promote collaboration and engagement in the learning and teaching culture of UB. In the process, both objectivist and constructivist instructional design strategies were advocated for appropriate use in such a way that they complement each other in the framework.

Various pertinent learning theories and philosophical assumptions underpinning the study were discussed in order to provide standards for clarifying and interpreting the conditions and observations of learning and teaching and to provide a bridge between instructional practice and theory. Pedagogical affordance of technology particularly WebCT was discussed with a view to identifying the pedagogical dimensions of effective online learning environments, and the criteria for evaluating the envisaged blended learning model.

Chapter 3: Learning and instructional systems design

The chapter begins with an overview of instructional design, and subsequently reviews the underlying theories of instructional design, the principles of constructivist learning models and the impact of instructional design on the creation of web-based learning environments. Finally it focuses on establishing a hybrid design approach by integrating face-to-face and online approaches. A literature review of critical success factors for technology integration was carried out; it revealed that the institutional leadership had a major role in facilitating the change process that comes with technology adoption. The changing role of the instructional designer in the context of technology integration was also discussed as it was critical to provide teachers a user-

friendly and non-threatening environment for technology adoption.

Chapter 4: Research Methodology and Design

The chapter aims at orientating the reader to the research paradigm, research methodologies, strategies and design used in the study, including procedures, participants, instruments, data collection and analysis methods.

The research strategies used was a descriptive and interpretive case study that was analysed largely through qualitative methods mainly using descriptive statistics. Participant observation, various interviews—individual as well as focus group—were used for data collection. Furthermore, the justification for each of the data collection methods used is discussed, while their relationship and importance within the study were considered. The chapter discusses the issues of validity and reliability with in an interpretive/constructivist qualitative research framework. Several strategies such as member checking, triangulation, and thick description are discussed as tools for evaluating the research and to ensure the trustworthiness of the study.

Chapter 5: Pedagogical design framework for the study

This chapter describes the development of a pedagogical design framework for the development of the blended learning course based on the pedagogical dimensions identified in the review of learning theories and the appropriate design principles distilled from a review of instructional design theories and models. This theoretically designed LAPTEL model was envisaged to provide a framework for good practice in engaging students in blended learning environments; it was designed to give greater control to students in order to promote and facilitate their own construction of knowledge in a more learner-centred environment using affordances of technology than that was possible in teacher-centred face-face-face classrooms. Further, based on the design principles derived from the literature, two evaluation instruments to assess the students' perceptions on the design of the course were developed and validated during the piloting stage of the model.

Chapter 6: The Design of the Web-based blended learning environment

A media prototype of the LAPTEL model was developed for implementing it in a blended learning environment. It was piloted first in order to improve the final implementation strategies and to validate the survey instruments. Subsequently, the final evaluation was carried out and its findings are discussed in Chapter 7.

Chapter 7: Summary, discussion, recommendations and conclusions

The summary of findings and other aspects emanating from the findings are further discussed in this chapter. It further includes conclusions and appropriate recommendations which form the basis of the proposed model. It also includes the perceived deficiencies of the study, and recommendations for further work in this field of study.

1.16   Summary

This chapter provides background information required by the readers to get an overview of Botswana HE landscape, its goals and aspirations, the social, structural and operational context of its only one public university- the University of Botswana, and the kind of learning and teaching context that are instrumental in achieving its vision and mission. The huge importance Botswana and UB in particular attach to ICTs and its role in education was highlighted. Furthermore, the purpose of the study was stated, while the questions and specific objectives guiding it were presented. Moreover, the chapter provided an overview of the research methodology and design, philosophical assumptions, and significance and limitations of the study which was meant to explore the possibility of introducing a blended learning approach in UB. Chapter 2 provides a theoretical framework for the study and a review of pertinent learning theories.