EXPERIENCES WITH TECHNOLOGY AMONG EARLY ADOPTERS AT THE UNIVERSITY OF BOTSWANA

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Abstract

This study explores the experiences with technology among early adopters in the transition from face-to-face (f2f) to distance education to online learning at the University of Botswana. The University of Botswana had used the national education policies, government reports, National Development Plans, Vision 2016, Maitlamo National ICT Policy, to guide them with their intentions to propose technology in the system and to professionally develop and train lecturers. Yet, the rate of adoption of new technology is slow. This study uses Rogers (2003) Diffusion of Innovation (DoI) theory and focuses on three concepts: the compatibility of technology, social systems, and early adopters, in order to understand and describe the lecturers' experiences with and use of technology in the transition process. A qualitative case study method was employed. The study used four methods of data collection: artifacts, secondary documents, interviews, and observations. Data collected using these methods were used to determine whether what was stated in the artifacts and secondary documents were actually corroborated by f2f in-depth interviews with nine participants from the Department of Adult Education in the Faculty of Education at the University of Botswana.

Three main findings resulted from the study. First, despite intense efforts from the University of Botswana to promote the transition to online learning, very little technology was being used outside of the f2f teaching. Second, even though the lecturers worked within an environment, which restricted the use of technology, they did what they could to use online technologies in the f2f teaching. Third, the top-down technology adoption

approach of the University of Botswana contributed to an environment that promoted minimal technology use and supported compatible technology use. Recommendations have been made for lecturers to be included in decision-making relating to technology, for online technologies to be promoted among students, for professional development and training to be considered along with time management training for lecturers, and for the university to plan, organize, and manage programs with all faculty and departments to share ownership of and responsibility for the programs.

Key Words: experiences with technology, diffusion of innovation, transition, compatibility of technology, social systems, face-to-face, distance education, blended and online learning, early adopters, adult education, University of Botswana.

Dedication

I dedicate this thesis to my husband Nzimande, two daughters (Kitso Yvonne and Sakhile Zanele), not forgetting my grandson Oratile Clement Denzil and my mother and mother in-law, Jostinah Mothelesi and Tshegang Dintwe, repectively. All their tender love, support, motivation, and encouragement has brought me today to accomplish my life's greatest highest academic achievement. Thank you and God bless you all.

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CHAPTER 1 - INTRODUCTION AND BACKGROUND INFORMATION TO THE STUDY

1.1 Overview of the Chapter

This study explores the experiences with technology use among early adopters in the transition from face-to-face (f2f) to distance education to online learning at the University of Botswana. The background to the problem that led to this investigation and the rationale for this study are outlined in this chapter. The overall questions that guided the collection of data are also presented. The section below includes the problem purpose statement and research questions concerning the adoption and diffusion of early adopters' experiences with technology in the transition from f2f to distance education to online learning at the University of Botswana.

1.2 The Problem Statement

Under British rule, Botswana's education system was underfunded and did not develop; thus, little expense was devoted to education (Nage-Sibande, 2005). Education became a priority in 1966 when the country achieved independence. In 1977, the first Botswana National Policy on Education was passed, placing emphasis on widening access to basic education. In 1994, the National Policy on Education was revised and the focus shifted to the quality of education. In 1997, the long-term Vision 2016 policy came into effect. This new policy emphasized the expansion of education into secondary schooling and access to higher education.

A further policy, the Botswana ICT-Maitlamo Policy, was introduced in 2005 and was implemented in 2007 to assist in achieving Vision 2016 by once again shifting the focus to online learning (Nage-Sibande, 2005; Sibande, 2011; Tau, 2008). These policies demonstrate the priority the Botswana government has given to education and, particularly, the more recent shift to distance education learning, particularly eLearning, as the pathway to an educated Botswana.

Yet, by 2013, few of the intended policy targets had been met. The University of Botswana responded to these policy imperatives and introduced eLearning in 2001, but as Mutula (2002) noted the process faced many challenges. Although there was a growing rate of participation by academic teaching[1] staff in distance education materials development at the University of Botswana, the transition from f2f to distance education with online learning had been slow (Masalela, 2011). Only a few early adopters, in Rogers' (1995) terms, had made the transition (Masalela, 2009; Rogers, 2003; Thomas, 2008). Rogers (1995) argued that the adoption of technological innovations often fail because diffusion processes do not take into account the cultural beliefs of local communities. Often, the compatibility of technology with "the values, beliefs, and experiences of individual early adopters in the social system" (p. 4) results in obstacles to technology adoption. Little research has been conducted on early adopters' experiences and beliefs of technology in the transition from f2f to distance education to online learning at the University of Botswana. This research study therefore aims to explore the

[1] Academic teachers refer to lecturers and professors, a term, which is used interchangeably with academic staff. These terms refer to academics that teach in the universities.

values, beliefs, and past experiences of early adopters in the transition from f2f to distance education with online learning at the University of Botswana. The phenomenon under investigation is not unique to Botswana and is shared with higher education institutions across the region and elsewhere that have traversed a similar journey in transitioning to online learning environments, as described on the literature review chapter.

1.3 The Purpose Statement and Rationale of the Study

Since implementation of eLearning in 2001 at the University of Botswana, Mutula (2002) reported that the University of Botswana faced with many challenges. Jefferis and Nemaorani (2013) noted in Botswana that out of 100 inhabitants there were only seven internet users. Despite strategies used by the University of Botswana to train lecturers on campus through the Centre for Academic Development, and to develop their ICT policies based on the government of Botswana National Maitlamo ICT policy (2007), the adoption of technology by lecturers and students at the University of Botswana education system was very slow and showed decreasing progress. However, these observations have not been extensively researched in Botswana. Using the University of Botswana as a case study, this study seeks to make a contribution in this area. The purpose of this study is to explore and understand the experiences with technology among early adopters in the transition from f2f to distance education to online learning at the University of Botswana. In conducting this research, Rogers' (2003) Diffusion of Innovation (DoI)

theoretical concepts the social systems, compatibility of technology, and the perspective of early adopters have been used to understand the transition.

1.4 Research Questions

Main Question: How did experiences with technology at the University of Botswana among early adopters influence the transition from f2f to distance education to online learning?

Secondary Questions:

- What are the characteristics, knowledge, skills, and beliefs/attitudes of lecturers at the University of Botswana?
- What are the challenges facing the lecturers at the University of Botswana transitioning from f2f to distance education with online learning?

The next section describes the specific context where research was conducted and participants were interviewed.

1.5 Setting of the Study

The study was conducted in Botswana at the University of Botswana. The faculties at the university that engaged in the transition from f2f to distance education pedagogies to online learning were the Faculty of Business (Accounting, Finance, Management, and Marketing) and the Faculty of Education (Adult Education), as stated

in Appendix H. The Department of Adult Education in the Faculty of Education was the focus of the study and participants were purposively selected from this unit. One cannot begin to understand the transition to online learning without a discussion of the context of Botswana. The following sections provide background information on Botswana's educational history as well as the political, geographical, social, and economic environments.

1.6 Background Information – Botswana

This section describes Botswana's political status, geographical location, social status, economic status, and the history of education in the country.

1.6.1 Political Status

Bechuanaland (Botswana) was a British Protectorate for almost eighty years before it became independent in 1966. In 1966, Botswana established a non-racial democracy that maintained freedom of speech, freedom of the press, freedom of association, and equal rights for its citizens (Ntseane, 1999). Scholars such as Beaulier (2003), and Molomo and Somolekae (1999), praised Botswana for its good governance. Botswana is a multi-party democracy, and has experienced stable political conditions since gaining its independence in 1966, as compared to other Sub-Saharan African, particularly Southern African, countries (Nage-Sibande, 2005). According to Parsons (1999), since 1966 Botswana has successfully maintained political and economic stability

for almost 35 years, especially when compared to other countries in Sub-Saharan Africa, and is regarded as a peaceful country.

1.6.2 Geographical Description of Botswana

Botswana is situated in Southern Africa, with a total of 542,000 square kilometers. It shares borders with South Africa, Namibia, Zambia, and Zimbabwe (see Figure 1.1). Botswana is a completely landlocked, semi-arid country (Jefferis & Kepaletswe, 2008; Jefferis & Nemaorani, 2013). Most of the southern and western semi-arid areas are covered by the Kalahari Desert, while the eastern, northeast, and east-south regions are fertile. Botswana is mostly flat with gentle undulations and occasionally rocky outcrops (Ntseane, 1999), and the Okavango River in the northwest drains from Angola. The Makgadikgadi Pans are large plains in the central and northeast of Botswana, and the rest of the country is covered with thick layers of sand in the Kgalagadi Desert (Ntseane, 1999).

Figure 1.1. Map of the Botswana Regions and Neighboring Countries
Source: Central Intelligence Agency's, The World Fact-book, 2004 (Copyright: Public domain)

Nage-Sibande (2005) noted that before and after Botswana's independence in 1966, the main means of transport from the north and Zambia is a railway line connecting Zimbabwe to the south of Botswana and South Africa, whereas in the eastern and western regions, the main means of transport is only by four-wheel drive trucks due to the sandy and dirt roads. Distance education learners attend residential sessions at the University of Botswana and travelling is often a problem for them due to bad sandy roads that take long to traverse by car. Distance education learners from the northeast area, on the other hand, travel easily because their roads are good. As a result, these learners do not face the same transportation challenges as their roads and railway lines are linked. Transportation linkage facilitated or hindered the communication process of education systems between Botswana and neighboring countries, and between rural and urban areas within Botswana, depending on the quality of infrastructure.

The weather conditions in Botswana determine the density of the populated areas (Botswana Central Statistics, 2000). The density of Botswana's population is concentrated in the eastern regions as compared to the sparsely populated southern and western regions (Republic of Botswana, Education Statistics, 2003; Nage-Sibande, 2005; see Figure 1.1). Botswana is geographically large, with a relatively low population density of 2.3 persons per 1000 square kilometers (Nhundu, & Kamau, 2002). According to Akenpelu (1995) and Ojedekun (1999), 80% of Botswana's land is arid, with a small population scattered throughout. Botswana's population since independence in 1966 has been growing steadily, and a population census has been periodically conducted every ten years since 1971, until very recently in 2011. According to these researchers, although

the population of rural areas was higher than the urban areas as noted in the 1991 census due to rural migration, the capital city of Gaborone's population is expectedly high, followed by Francistown (see Figure 1.1).

The report of the 2001 census showed Botswana's population as 1,680,863 compared to the 2011 census, which showed a population of 2,024,787. The 2011 census showed robust population growth averaging 1.9% a year from the previous 2001 census (Republic of Botswana, Population and Housing, 2011), which is in line with the growth rate of students and teachers in schools. In addition, according to the reports the University of Botswana student population is currently high (University of Botswana, 2008b, c, d, e). The growth rate of the Botswana population between the 1991 census and the 2011 census is the reason for the government's strategic use of policies to provide guidance on making education more accessible to the population at large in Botswana, hence Education For All (EFA, 1990)[2] as a people's right as stated by Letshabo (2000). In addition, EFA being part of a global commitment by many countries to provide quality education, and was also one of the Millennium Development Goals (MDG) (Letshabo, 2000).

> According to Letshabo (2000), EFA was the theme of the World Conference held in Jomtien, Thailand in 1990, where the world community expressed their commitment to Article 26 of the Universal Declaration of Human Rights, and adopted a rights-based approach to the provision of education in their countries.

[2] According to Letshabo (2000) EFA which stands for Education for All, was a global movement led by the United Nations Educational, Scientific and Cultural Organization (UNESCO) that aimed to meet the learning needs of children, youth and adults by 2015. Botswana joined to promote the aim nationally, hence the intended use of emerging technologies to access university programs online.

> The Jomtien conference resulted in a declaration, which is known as the World Declaration on Education for All: Meeting Basic Learning Needs (p.1).

Since Botswana's education standard was very poor, the issue was how to make education accessible in different regions taking into account their geographical situations, population density, and relationships with the four neighboring countries (see Figure 1.1). The Botswana government developed national policies aimed at making education available and accessible to all in Botswana, reaching all geographically scattered areas equally, including remote rural and urban regions (Botswana Maitlamo ICT Policy, 2007; Republic of Botswana - Revised National Education Policy, 1994; Republic of Botswana National Development Plan - 9, 2003/4, Republic of Botswana National Development Plan - 10, 2008).

1.6.3 Social Status

At the time of independence, Botswana's social and infrastructure development was extremely low and underdeveloped (Jefferis & Kepaletswe, 2008; Jefferis & Nemaorani, 2013). The new government of Botswana therefore redirected the revenues derived from the mining sectors to fund social provisions such as schooling, health, safe clean water, roads, and the transport of public goods. Considerable development was achieved through these funds such as universal primary and junior secondary schooling, health care, clean water supplies, roads, and transportation (Jefferis & Kepaletswe, 2008; Jefferis & Nemaorani, 2013). One of Botswana's main setbacks was the spread of HIV/AIDS, which meant that Botswana was the most HIV affected country in the world.

Botswana has managed to fight the HIV/AIDS pandemic through a number of strategies such as making available free anti-retroviral drugs and HIV/AIDS testing. The HIV/AIDS pandemic affected education systems in Botswana: many lecturers, teachers, students and parents were affected and many died.

Socially, the two languages spoken in Botswana's education systems are Setswana and English (Nage-Sibande, 2005). Botswana, as a former British colony, uses English as the main language of instruction in schools, technical institutions, colleges, and the University of Botswana. Although English is the main language of instruction in the education system, students generally have problems with English language literacy. The English language is taught from kindergarten to the university level, but even students at the university level struggle with language proficiency.

1.6.4 Economic Status of Botswana

At independence in 1966 Botswana was rated the poorest country in Africa (Ntseane, 1999). The economic situation in Botswana changed after its independence in 1966 due to the discovery of minerals in 1967 and the diversification of the economy. Botswana's diamond exports exceeded other minerals in export value, as the country became the largest producer of diamonds in the world (Totolo, 2007). This is the reason why Botswana has had one of the world's highest economic growth rates since independence, especially when compared to other African countries. The United Nations

has rated Botswana as a middle-income country based on Gross Domestic Product (GDP) growth (United Nations in Botswana, 2005, cited in Totolo, 2007). Botswana's main sources of income are mining, agriculture, tourism, and manufacturing (Jefferis & Kepaletswe, 2008; Jefferis & Nemaorani, 2013). According to Jefferis and Nemaorani, the Botswana GDP in some sectors decreased while others increased in 2012. This had an impact on economic growth, which affected the cost of education systems in Botswana and an employment rate that could facilitate payment of education.

These percentages are reported in Table 1.1 in 2012, which in 2008 showed some differences (increased, decreased, none). Botswana's highest source of income was the mining sector at 44% in 2006/07, and dropped to 13% in 2012. It is fundamentally a resource-based economy supplemented by other areas such as the government at 16% which decreased to 14%; trading, hotels, and restaurants at 11% to 18% increase; and business at 10% to 15% increase as reported on Table 1.1. Beef used to be among the main exported products to the Western world but since the outbreak of foot and mouth disease, cattle are no longer being locally slaughtered and processed as fresh meat. The beef was processed through the two main production sites in Botswana, the Botswana Meat Commission located in the south of Botswana and Lobatse in the North-Western site of the Ngamiland area in Maun (see Figure 1.1). During these times, people in Botswana used to sell their cattle and were able to finance educational expenses for themselves and their children. It has been reported that the diamond business in Botswana has been affected by the 2008 economic recession and the price of diamonds has dropped, having a drastic effect on the economy. Consequently, there is a need for

the Botswana government to find ways and means of maintaining their economic status through a major source of income. Although some sectors showed an increase, there was no major progress in the use of technology (Jefferis & Kepaletswe, 2008; Jefferis & Nemaorani, 2013).

Table 1.1

Structure of the Botswana GDP, 2006/07, and 2012

Botswana Source of Income	**2006/07 in %**	**2012 in %**	**Difference in %**	**Effect**
Water and Electricity	3	1	2	Decrease
Transport and Communication	4	6	2	Increase
Agriculture	2	2	0	None
Trade, Household, and Restaurant	11	18	7	Increase
Social and Personal Services	4	7	3	Increase
Mining	44	13	31	Decrease
General Government	16	14	2	Decrease
Manufacturing	4	6	2	Increase
Construction	4	8	4	Increase
Banks, Ins. (Fin.) and Business Services	10	15	5	Increase

Source: Central Statistics Office (CSO) (Jefferis & Kepaletswe, 2008; Jefferis & Nemaorani, 2013)

1.6.5 History of Education in Botswana

Before independence in 1966, Botswana was a British colony. During this period the education system was governed, administered, and managed by the British (Monyatsi, 2002). The colonial government invested little in formal 'western' education, and the education that existed was developed and necessitated by missionary projects and the need for literacy skills to promote Bible reading (Mafela, 2010). While the colonial authorities did establish some schools, they were few in number and tended to focus on producing a limited number of people for the few available positions for employment in the colonial government. Secondary education was largely neglected. As Mafela (2010) argues: "the British colonial government sought to use education to address the habits of industry, and to offer basic literacy to enable Batswana[3] to perform clerical and semi-skilled tasks" (p. 69) specific to the lower level jobs they offered Batswana. Monyatsi (2002) concurs that the education system was poorly developed at the time of independence in 1966. While the colonial government did not fully control the education system, it implicitly directed educational development through grants to mission societies. As education became more entrenched, the colonial government recognized the value of employing locally educated civil servants.

Education during the colonial period did not address the needs of the Batswana, but rather emphasized the needs of the colonial power (Major & Tiro, 2012). The primary education that did exist was of poor quality. As Major and Trio (2012) suggest, the British government was not prepared to invest in teacher preparation. Instead,

[3] Batswana refers to the people and Botswana is the country (see Figure 1.1)

teachers were sent to neighboring countries like South Africa and Zimbabwe for training. It was argued that, "primary teacher education was indeed of low quality as the student teachers admitted at these colleges were mostly standard seven leavers and junior certificate (Form 3 and later Form 2) failures" (p. 64).

The number of schools and students gradually increased during the later colonial period and after independence. Therefore, there was a need to train teachers quickly due to the increased number of students in schools in the period between 1960 and 1965 (Kamau, 2007; Nage-Sibande, 2005). These teachers were trained through correspondence programs in distance education mode, which was fully print-based. The print-based mode relied on hard copies of learning materials that were posted through the mail to individual teacher learners, with additional material being taught through radio and television lessons (Nage-Sibande, 2005; Tau, 2008). Jones (1979) argued that the Salisbury Correspondence College in Southern Rhodesia offered an intensive program intended to expedite the supply of teachers to the increasing number of schools. In other words, teachers were trained quickly to meet the increasing demands and needs of individuals' growing access to education.

At that time, there were not many schools, with most of the schools being in the southern part of the country. The training of teachers was done in neighboring countries like South Africa and Zimbabwe due to the low standard of education in Botswana at that point. The other issue that arose was that the colonial government did not employ local thus there were few highly trained and qualified local workers. This left Botswana with

unqualified people for specific jobs that needed highly trained staff. When Botswana became independent in 1966, it began educating teachers through correspondence distance education programs to deal with the increasing student-to-teacher ratio.

Following independence, the Government of Botswana's goal was to offer equal Education For All (EFA, 1990; UNESCO, 2000). According to Letshabo, because EFA's goal was to improve the quality of education, Botswana embraced EFA's goals in order to promote quality within its education system. In 1973, the Botswana Extension College was established as part of the Ministry of Education, which was incorporated into the Department of Non-Formal Education, and created in 1978 (Tau, 1997). The Botswana Extension College and Department of Non Formal Education issued several important reports and policies with the goal of ensuring equal, accessible, and high quality education for Botswana's students.

Furthermore, the government passed two major national education policies as initiatives for providing universal access to education and promoting quality education. This policy led to the establishment of the University of Botswana in 1982, which was the first and only public university in the country (Kamau & Selepeng-Tau, 1998; Tau, 1997) until 2012 when Botswana University of Science and Technology was opened in Palapye. Following this, the long-term National Vision 2016 (1997) was implemented as a means to educate the nation by 2016, with a focus on technology.

The long-term Vision 2016 (1997) plan was based on evaluating what the Botswana government had accomplished in 50 years from 1966 (after independence) through to 1997 and beyond to 2016. The aim was to identify the challenges, successes, and strategies encountered throughout the 50 years since Botswana's independence and to use this knowledge to improve the present Vision 2016. One of the most important Vision 2016 objectives was to have an informed, educated, and computer literate nation by 2016. It also emphasized the role of computers and the internet in ensuring the quality of education and universal access to education, with the intention of computer and internet access being made available to schools and tertiary education systems. This was an opportunity for all citizens of Batswana to access universal quality education as an informed and knowledgeable nation, and to be aligned with global changes.

The Adoption of the Revised National Policy on Education (1994) led to the establishment of the Centre for Continuing Education at the University of Botswana and the Botswana College of Distance and Open Learning as a semi-autonomous and statutory organization created by an act of Parliament. The Centre for Continuing Education and Botswana College of Distance and Open Learning were established as the main agencies of distance education and open learning to facilitate learning through modern technologies in Botswana.

1.6.6 The Development of Distance Education

Prior to the Centre for Continuing Education and Botswana College of Distance and Open Learning, the Botswana Extension College's mandate was to offer courses to school youths and adults at secondary school levels. The focus was on distance education mode of delivery using print-based materials, radio broadcasting, and f2f modes in the study centers (Nage-Sibande, 2005; Nhundu, & Kamau, 2002; Sibande, 2011; Tau, 2008). The Ministry of Education incorporated Botswana Extension College into the Department of Non-Formal Education in 1978. Due to some issues with resources, infrastructure, expertise, and learning materials, the Department of Non-Formal Education became the Botswana College of Distance and Open Learning in 1996/98 (Nage-Sibande, 2005; Nhundu and Kamau, 2002; Peter, Tau and Mensah, 2006; Tau, 2008).

Botswana College of Distance and Open Learning, was the first open and distance learning University in Botswana, and promoted open access to Education For All in line with national policy objectives. However, despite satisfying national policies and lofty goals, researchers have observed that distance education learners and even the lecturers at the University of Botswana have negative attitudes towards distance education (Kamau, 1999, 2007; Masalela, 2009, 2011; Mutula, 2002; Sikwibele & Mungoo, 2009; Thomas, 2008).

1.6.7 University of Botswana

The Universities of Bechuanaland (Botswana), Basotholand (Lesotho), and Swaziland amalgamated in 1964 to reduce the reliance of the three countries on external assistance in the South African apartheid era (Letshabo, 2000). It was four years after Botswana's independence in 1966 that the Universities of Botswana, Lesotho and Swaziland were established as a joint university. However, in 1975 Lesotho withdrew and formed its own national university, which led to the establishment of the University of Botswana and Swaziland. Then, after several years together, the University of Botswana and Swaziland were divided into two separate national universities. Seven years after the separation from University of Swaziland, the University of Botswana was established in 1982.

The University of Botswana was a response to a demand from the two national education policies of Botswana, the National Commission on Education, (1977), and the Revised National Policy on Education, (1994) by solidifying its distance education activities into the Centre for Continuing Education. It also responded to the National Development Plan 9/10 (2003, & 2008); Human Resource Development Council (2014), which was called the Tertiary Education Council (2008a & b); Vision 2016 (1997); and the Botswana National Maitlamo ICT Policy (2007). The University of Botswana was to offer the same f2f courses through distance education to enable the community at large to access higher education courses and programs (Kamau, 2006). According to Tau (2008), "It was envisioned that the University would then offer its programmes through both

modes, the conventional and distance education, and would thus become a dual mode institution" (p. 203). Similarly, Sibande (2011) notes that the university would offer its programs through both modes, the classroom f2f and distance education with online learning, and would thus become a dual mode institution.

The University of Botswana initiated distance education programs in 1982, offering a certificate in adult education through the Department of Adult Education in collaboration with the Department of Nonformal Education. Then the Centre for Continuing Education introduced distance education in 1991 (Sibande, 2011; Tau, 2008). The Centre for Continuing Education has four units, the Extra-Mural Unit, Distance Education Unit, Public Education Unit, and Technical Support Unit, and they launched a Diploma in Primary Education in 1999 (Kamau & Selepeng-Tau, 1998; Tau, 2008). The distance education mode of delivery at the University of Botswana was print-based with audiocassettes and f2f sessions. The Centre for Continuing Education mainly worked collaboratively with the Faculty of Education to train lecturers and the Faculty of Business through distance education delivery.

In 1999, the use of eLearning technology was initiated at the University of Botswana and implemented in 2001 (Mutula, 2002). The University of Botswana lecturers were trained in-house by the Centre for Academic Development in the Department of Educational Technology, through workshops, seminars, and conferences to facilitate the use of technology in teaching and learning. Despite all the policies and intended transitions into eLearning, use of eLearning technologies has remained low at

the University of Botswana. Online technology is available on campus and lecturers are trained through the Centre for Academic Development, however, as this study will show, despite the availability, there is little uptake on use.

The purpose of collaboration between the University of Botswana's departments, namely the Centre for Continuing Education and other faculties, was to adapt some courses and programs from f2f to distance mode, and later to an online learning model in order to increase access to higher education for people in the rural areas (Tau, 2008, p. 203). The section below describes the Department of Adult Education in the Faculty of Education at the University of Botswana.

1.6.8 Department of Adult Education

The Department of Adult Education, as shown in Appendix H, is located in the Faculty of Education. It originated in the early 1980s from the Department of Non-Formal Education in the Ministry of Education and offers courses to adults, as was outlined in the policies. (Republic of Botswana, Revised National Policy on Education, 1994).

Certificate programs were designed and offered to adults at work to advance their skills and knowledge. The adult education certificate program was later moved to the University of Botswana in 1982 from the Department of Non-Formal Education and, in addition, offered diploma courses on adult education. Since adults have responsibilities

such as work and family it was proposed to offer the program through distance education to allow a flexible learning environment.

This study selected the Department of Adult Education lecturers and professors, as stated in Appendix H, because they were expected to use technology in teaching their distance education courses which were previously offered through the f2f mode. It was with this understanding that eLearning technologies were introduced and implemented in 2001, as evidenced by Mutula (2002) in his study of the use of electronic media in education.

Preliminary studies conducted on the use of eLearning at the University of Botswana for teaching and learning found that lecturers were resistant to technology and thus showed a low rate of adoption and diffusion of innovative technology use (Eyitayo, 2005; Masalela, 2006, 2009, 2011; Thomas, 2008). The current study takes this further and explores how the early adopters' use of technology and their experiences influenced the transition process from f2f to print-based distance education and online media at the University of Botswana.

1.7 Significance of the Study

This study gives insights as to how and why the adoption and diffusion of technology used by lecturers in a university is helped or hindered by contextual factors. Rogers (2003) argues that the adoption and diffusion of technology is a linear process,

where the innovators influence early adopters who will convince the late adopters. In other words, Rogers's theory assumes that ultimately everybody in the social system adopts technology linearly. This study shows that the process of technology adoption is complex and diffusion of innovation occurs despite severe barriers. The study further builds on and contributes to research on the adoption and diffusion of technology innovation, particularly within Botswana.

1.8 Organization of the Dissertation

The thesis consists of eight chapters. Chapter one introduces the readers to the study, informing them about the background information, data collection, the purpose, problem, research questions, and significance. The second chapter consists of literature reviews addressing studies with similar topics, which informed the researcher on what has been done and the gaps in scholarship. This chapter also focused on the theoretical framework, which is the lens through which the study was explored and understood. Chapter three describes the context of the study. The research design and methodology are described in chapter four, detailing how data was collected and analyzed. Chapter five is the review of policy context of education in Botswana, which explores the context in which the early adopter operates, offering critical reviews of secondary documents including the National Education Policies, the Central Statistics Office reports on education systems, the National Development Plans, and the Botswana National Maitlamo ICT Policy. The sixth chapter outlines the results of the study based on the interviews, participants' responses and observations, and after analysis of the artifacts

such as teaching and learning materials used by the lecturers. This chapter informs readers about the participants. In addition to the results described in chapter six, chapter seven further reports the results relevant to the research questions. Chapter eight provides a discussion of the results, followed by suggestions for future research, recommendations, and final conclusions.

CHAPTER 2 – CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

2.1 Overview

The purpose of this study is to explore experiences with educational technology adoption among academic teachers at the University of Botswana. This chapter outlines Rogers' (2003) Diffusion of Innovation (DoI) theory, related instructional technology theories, and models and reviews studies that have used Rogers' theory in higher education.

2.2 Rogers' Diffusion of Innovation Theory

Rogers' theory has been used widely to understand why the adoption and diffusion of innovation varies across different social systems. Gabriel Tarde (1895) originally developed a DoI theory and first came up with the Laws of Imitation and the Theory of Invention. Rogers, having been influenced by Tarde's (1903) theory, developed his own theory in 1960, further refined it in 1962, and modified it again in 1995 and in 2003.

According to Rogers (1995), diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). This is the most commonly quoted theory in the field of diffusion of innovation and is based on four main elements of diffusion identified by Rogers:

innovation, communication channels, time, and the social system. Many studies, theories, and models in the field of diffusion of innovation have been informed by this theory (e.g., Burkman, 1987; Davis, 1986; Hall & Hord, 2014; Surry & Farquhar, 1997; Surry, 1997). Of the many relevant studies Rogers' theory has been used to understand why some individuals adopt technology innovation and others do not.

Rogers' theory has been used to explore the implementation of eLearning in teaching and learning in universities (Jacobsen 1998; Less, 2003; Samarawickrema & Stacey 2007; Shea, Pickett, & Sau Li, 2005). In addition, the theory has been used in the adoption and diffusion of instructional technology (Ellsworth, 2000; Ely, 1999; Hall & Hord, 1987; Surry 1997; Surry, Ensminger, and Jones, 2003). The following section describes the five components of Rogers' DoI theory.

2.2.1 Elements of Diffusion of Innovations

Rogers' four elements of DoI are briefly defined as follows: 1) "innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (p. 11); 2) communication channels are part of "a process in which participants create and share information with one another in order to reach a mutual understanding" (Rogers, 2003, p. 5); 3) time is a process over which adoption and diffusion takes place; and 4) social systems are "a set of interrelated units engaged in joint problem solving to

accomplish a common goal" (p. 23). These four elements are reflected in most studies using Rogers' theory and in other theories and models developed on the basis of Rogers (Hardaker & Singh, 2011; Jacobsen, 1998; Russell & Bradley, 1997; Samarawickream & Stacey, 2007; Surry, 1997; Teo 2008). One can see that for an innovation to be known and/or used by other potential adopters in the system it takes time, hence Rogers' (2003) claims that diffusion is an S-curve process but more commonly called the bell or normal curve (see Figure 2.3). During this time, adopters make decisions, commonly through interpersonal communication networks, about adopting an innovation in a system (Rogers, 2003).

Rogers' (2003) definition of diffusion focuses on the elements of adoption and diffusion of innovations communicated through various channels in a social system over a period of time. Rogers refers to diffusion as a type of communication through which a change agent communicates innovations as new messages to members in a social system. A change agent, as noted by Rogers, usually does the initial introduction of an innovation to the members. According to Rogers (1962) "a change agent is an individual who influences clients' innovation decisions in a direction deemed desirable by a change agency" (p. 312). A change agent is a person, individual, organization, or unit that initiates the diffusion of an innovation. Rogers (1962) claimed that the newness of an idea gives diffusion its special character. He argues that diffusion is a type of social change through which either accepting or rejecting an innovation can bring changes in the structure and function of the social system. According to Rogers, new messages are innovations that members discuss or share ideas about within the organization: a social

system through mass or interpersonal communication channels. The concept of a social system is used as a framework to explore and understand this study and is therefore described in detail below.

2.2.1.1 Social Systems

The purpose of this section is to describe a social system in the context of higher education as an organization from a macro scale. According to Rogers (2003), as previously noted, a social system refers to the context, culture, and environment in which an individual is involved. He earlier defined it as "a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal" (Rogers, 1995, p. 23). The interrelated units or members could be individuals, organizations, informal groups, and/or subsystems as members of a social system. Many studies used universities from a social systems perspective in which technological innovation is adopted and diffused through a process of time by individual adopters as members operating in the same system (Akir, Butcher, & Tsao, 2003; Bennett & Bennett, 2003; Birch & Burnett, 2009; Keesee & Shepard, 2011; Laronde, 2010).

However, Deligiannaki and Ali (2011) argue from a socio-cultural perspective that "innovation can be 'good or bad'; there is a system of norms and rules written or not that 'trap or release' an innovation" (p. 387). Their definition of social focuses on cultures with norms and rules, hence their main question is "can the social culture be the fundamental reason for the success and failure of innovations?" (p. 387). Though Rogers

did not define culture, he defines a social system as a context in which early adopters are involved and operate their work, as in this case of teaching and learning. A good example of such a system would be a group of lecturers and their support team within a given department or faculty in a university. Therefore, Deligiannaki and Ali's (2011) definition of social culture resonates with that of Rogers (2003) insofar as the norms and rules are university mandates or policies binding the lecturers; thus, they share some common cultural values and norms. Rogers refers to the social systems mandates as structures, as previously noted. As an example, Robertson (1971), as cited in Dubois (1972) views social systems mostly from a "farming studies perspective as a farming community, often a country, to think of it in terms of age, income, social class, or any other criteria of market segmentation" (p. 840). Robertson's definition of a social system resonates with Rogers' views in that a farming community shares common cultural values and norms. Therefore, as a broad definition, social systems can be understood as work environments, organizational groups, informal groups, and all the various subsystems of any of these groups that share common norms and rules for meeting common goals in the social system (Rogers, 1962).

An organization is a social system through which the innovation or new idea is communicated by adopters over time. Figures 2.1, 2.2, and 2.3 demonstrate the spread and rate of the adoption of technology innovation diffused over time in a social system through a process of communication among the adopters of the innovation (Rogers, 2003). Rogers' theory states that the adopters of an innovation can decide to accept or

reject it over a period of time by collecting knowledge from peers and making decisions to implement it as shown in Figure 2.1.

In summary, the social system defines the context in which an individual adopts and diffuses an innovation (Rogers, 1995). The social system as an organization has structures such as policies, support, rewards, training, and workshops; and this influences early adopters' behaviors, through which they communicate the innovation to other adopters such as late adopters. It is by understanding how the social system influences the behavior of both early and late adopters that we can see how technology is diffused through the social system. On this basis, therefore, the social system in the context of this study refers to the university in which early adopters adopt and diffuse technology innovation to operate or do their assigned work.

2.2.2 Innovation-Decision Process

Rogers (2003) described the innovation-decision process as "an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation" (p. 172). He further defines the innovation-decision process as a process through which an individual (or other decision-making units) move from first gaining knowledge of an innovation to forming an attitude toward the innovation. The persuasion stage follows the knowledge stage in the innovation decision process and involves making a decision either to adopt or reject, and/or implement by using the new idea or innovation. This is then followed by

confirmation, which involves seeking reinforcement or support for the innovation decision already made. The confirmation stage as shown in Figure 2.1 is where the adopter, based on the type of support, develops an innovation behavior, feels dissonant (conflicting with self and the organization's beliefs) towards an innovation and later can decide to discontinue or reject an innovation previously accepted. According to Rogers (2003) the five stages of the decision process are knowledge, persuasion, decision, implementation, and confirmation. These stages follow each other in a timely manner as noted in Figure 2.1 based on prior conditions, the characteristics of the decision-making unit, communication channels, and perceived attributes with the rate of adoption.

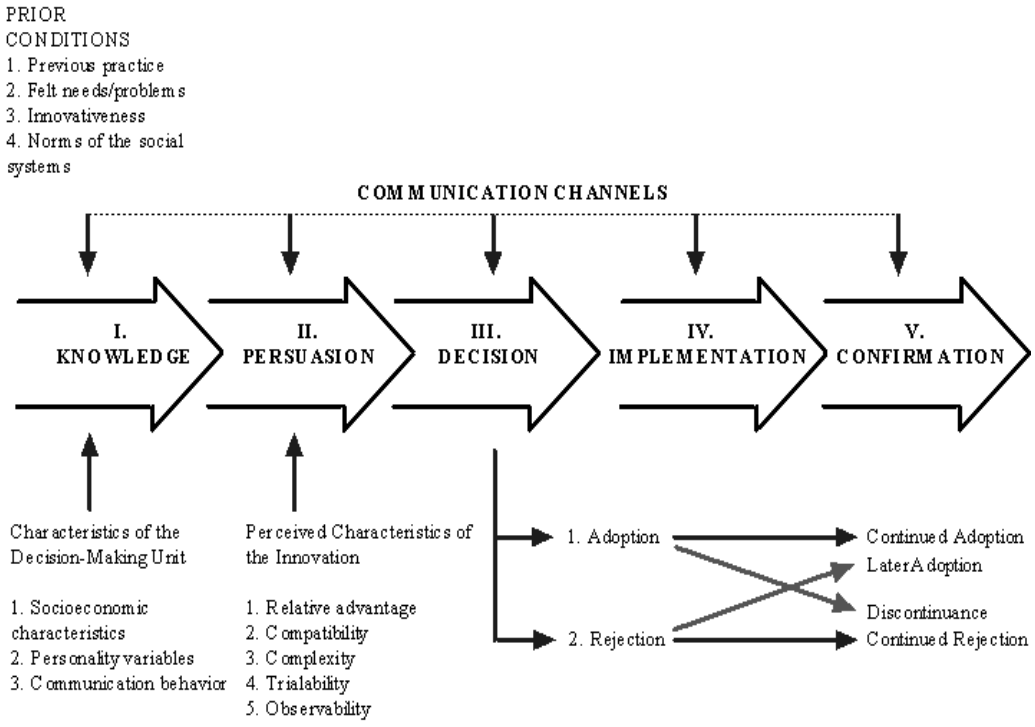


Figure 2.1. A Model of the Stages in the Innovation-Decision Process

Source: (Rogers, 1995, 2003)

Note: Permission to use this table was granted from Free Press, Division of Simon & Schuster of Publisher

2.2.3 Rate of Adoption

Rogers (2003) defined the rate of adoption as "the relative speed with which an innovation is adopted by members of a social system" (p. 221). The rate of adoption is measured according to the number of individual adopters over a period of time (Rogers, 2003). The rate of adoption takes an "S" curve shape or commonly the bell curve as in Figure 2.3, where the adoption of the first stage is slow and gradually speeds up, reaching a maximum level, and then declines. Rogers (1995) claims that the type of decision-making, communication channels, the nature of the social systems—that is, norms or structures, change agents as initiators of the innovation, and perceived attributes of an innovation—are all variables that determine the rate of adoption of innovations (see Figure 2.2). Rogers argues that when the decision is made on the adoption and diffusion of an innovation it occurs at a faster rate when an optional decision is made by an individual and is slower when a decision is collectively made in an organization.

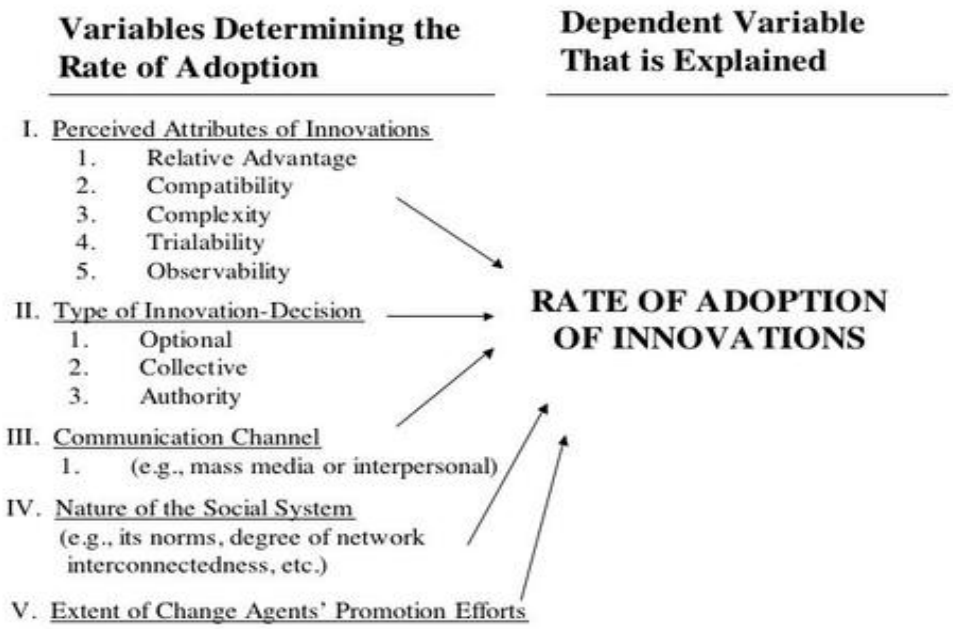


Figure 2.2. Variables Determining the Rate of Adoption of Innovations

Source: (Rogers, 1995, 2003)

Note: Permission to use this table was granted from Free Press, Division of Simon & Schuster of Publisher.

2.2.4 Perceived Attributes

Rogers argues that, "The perceived attributes of an innovation are one important explanation of the rate of adoption of an innovation" (Rogers, 1995, p. 206). The perceived attributes of an innovation determine the percentage differences on the rate of adoption by an individual or a social unit. An individual or a social unit adopts an innovation if it is perceived as having particular characteristics in line with the needs, beliefs, experiences, values, and knowledge of the individual or unit. Rogers (2003) identified five attributes of an innovation: 1) relative advantage, defined as "the degree to which an innovation is perceived as being better than the idea it supersedes" (p. 229); 2) compatibility, which is "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (p. 15); 3) complexity, defined as "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 15); 4) trialability, or "the degree to which an innovation may be experimented with on a limited basis" (p. 16); and, 5) defined observability, which is "the degree to which the results of an innovation are visible to others" (p. 16). The concept of compatibility is further defined below because it is one of the main concept used to guide this study.

2.2.4.1 Compatibility

The compatibility of an innovation is the level at which individual experiences are compatible with the new technology. This refers to the beliefs, experiences, values, needs, skills, knowledge, and characteristics of individual technology adopters (Rogers,

2003). If compatibility does not exist the innovation will not be adopted (Samarawickrema & Stacey, 2007). According to Rogers (2003) if the compatibility of an innovation is high the adoption and diffusion of an innovation is easily adopted at a higher rate. It is from this view that organizations like universities use academic teachers to persuade their colleagues, peers in the system, to adopt technological innovation. Therefore, it is important for organizations to understand individual adopters' experiences and their backgrounds to see the impact on the adoption of the innovation. Otherwise, if an adopter's experiences are not compatible to the innovation, it will not be adopted (Jacobsen, 1998, 2000). The attributes of innovation have been used by several studies in exploring the rate of adoption as perceived by individual adopters in the system, and one of the most commonly used attributes of innovation for the purpose of this study is the compatibility of an innovation with adopter experiences (Akir, et. al., 2003; Bennett & Bennett, 2003; Birch & Burnett, 2009; Jacobsen, 1998; Keesee & Shepard, 2011; Samarawickrema & Stacey, 2007).

In summary, Rogers (2003) argues that when the relative advantage, compatibility, simplicity, trialability, and observability are high, the innovation will be adopted faster and at a higher rate. Rogers does caution that, "getting a new idea adopted, even when it has obvious advantages, is difficult" (p. 1), so the availability of all these variables of innovations affects the speed of the innovation diffusion process to different degrees. Again, much research has been conducted on these attributes and how they affect the rate of adoption and diffusion of an innovation in a social system (Akir, et. al, 2003; Bennett & Bennett, 2003; Samarawickrema & Stacey, 2007).

2.2.5 Adopter Categories

Rogers (2003) categorizes the adopters as classifications of members of a social system. The members include innovators, early adopters, early majority, late majority, and laggards as noted on Figure 2.3. Jacobsen (1998) grouped adopters into early, mainstream and laggards. In addition, she said that adopters as innovators adopt and diffuse an innovation at different times based on individual rates of adoption. The purpose of this section is to describe early adopters as a concept based on Rogers' (2003) views for understanding this study.

Individuals do not adopt an innovation equally and at the same time. Rogers (2003) explained this by classifying and categorizing rates of adoption according to the time the adopter starts using the innovation. These adopter categories are defined as "the classifications of members of a social system on the basis of innovativeness" (p. 22). Adopters are similar in terms of innovativeness, in that "innovativeness is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas compared to other members of a social system" (p. 22). Therefore, adopters are classified based on standardized percentages determining the earliest adopter (see Figure 2.3). Rogers did not include non and or incomplete adopters in the S-curve or bell curve percentage distribution because he believes ultimately all adopters in the system adopt and diffuse the innovation technology. The percentages are as follows: innovators 2.5%, early adopters 13.5%, early majority 34%, late majority 34%, and laggards 16% as noted

on Figure 2.3 (Rogers, 2003). All the adopter categories add up to the total number plotted over time, resulting in an S-curve shape or bell curve.

Rogers (2003) further grouped the adopters into early adopters and late adopters. Early adopters include innovators who are venturesome, willing to experience new ideas, and who bring innovation from outside. Early adopters tend to take on an innovation shortly after the actual innovators (see Figure 2.3) and they generally hold leadership roles, and perform as role models. It is between early adopters and early majority that Rogers assumes the innovation will reach a critical mass for a sufficient number of adopters in a social system so that the rate of adoption becomes self-sustaining for further growth. Therefore, early adopters are expected as role models to create a rapidly increasing rate of innovation growth by introducing the innovation to the early majority.

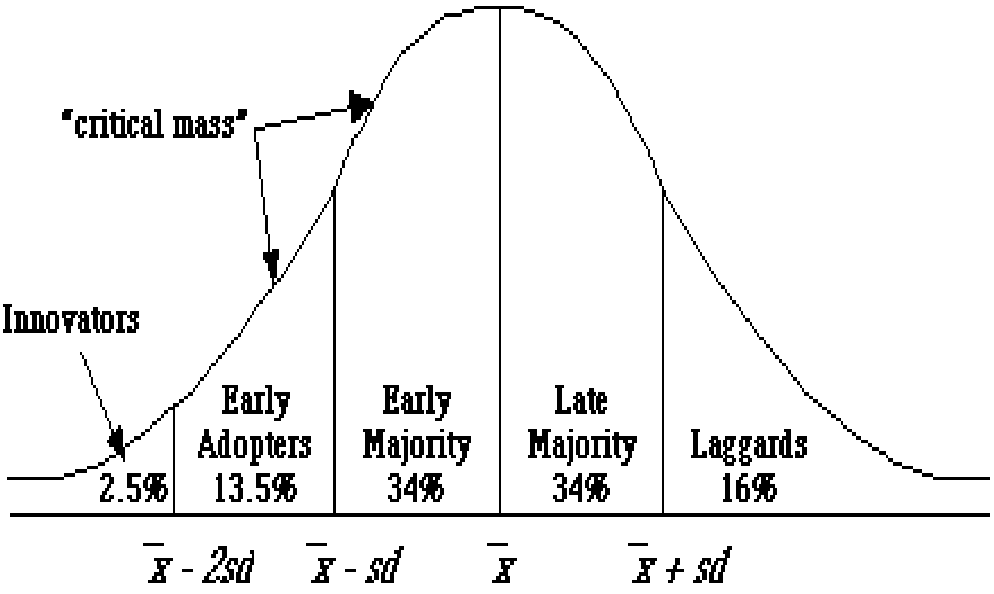


Figure 2.3. Adopter Categorization on the Basis of Innovativeness

Source: (Rogers, 1995, 2003)
Note: Permission to use this table was granted from Free Press, Division of Simon & Schuster of Publisher

The early majority then frequently interacts with peers and deliberately adopts an innovation. Late adopters consist of late majority and laggards. Late majority are skeptical about an innovation and its outcomes but often, economic benefits (salary, promotions, money rewards) and peer pressure lead them to adopt the innovation. Laggards generally resist innovation, are more skeptical, and have traditional values. Socioeconomic status, personality variables, and communication behaviors affect how these groups behave, as is shown in Figure 2.1.

2.2.5.1 Early Adopters

Numerous studies have used the concept of early adopters in the adoption and diffusion process of technology innovation in higher education (universities) (Hixon, Buckenmeyer, Barczyk, Fieldman, & Zamojski, 2012; Jacobsen, 1998, 2000; Keesee & Shepard, 2011; Less, 2003; Martin, Prosser, Trigwell, Ramsden, & Benjamin, 2013; Reid, 2007; Soffer, Hachmias, & Ram, 2010). Early adopters as leaders and role models work closely with the initiators of the innovation technology as members of the social system. The initiators are the change agents who introduce an innovation based on their relationship with early adopters. They expect the early adopters to adopt an innovation and then diffuse it through the system for change (see Figures 2.1; 2.2; 2.3). For example, studies have acknowledged the fact that change agents initiate change by introducing an innovation technology for adoption within the social system, which impacts on the rate of adoption and diffusion of an innovation process through which the early adopters operate (Ellsworth, 2000; Jacobsen, 1998; Less, 2003).

Early adopters are opinion or social leaders, educated, and are popularly known as important members of a social system who facilitate, adopt, integrate, and diffuse an innovation after the initial innovators (Rogers, 2003). They are respected in a social system for their well-informed decision-making (Rogers, 1995). It is important to understand early adopters and how their experiences influence or are influenced by the system's structures, or the attributes of an innovation. Therefore, studies on higher

education that have used Rogers' theory are reviewed in the next section based on the specific conceptual frameworks relevant to this study.

Rogers' theory has been so widely researched that it has been called a "theoretical paradigm" (Rogers, 1976, p. 291) or a meta-theory (Surry and Farquhar, 1997). As with any meta-theory and given the wide application of this theory in research, there have been many criticisms of Rogers' theory. In the early 1970s, Rogers himself, with Shoemaker (1971) conducted a comprehensive analysis of diffusion-based research and established some key criticisms.

2.3 Criticisms of Rogers' Diffusion of Innovation Theory

Rogers and Shoemaker (1971) reviewed 1,500 studies on diffusion of innovation and found the following problematic areas as was noted in 1962 by Rogers (pp. 91 to 118): pro-innovation bias, individual blame bias, and equality in the diffusion of innovation.

2.3.1 Pro-Innovation Biasness

Rogers (2003) argues that the S-curve represents only successful adopters and excludes incomplete and non-adopters (see Figure 2.3). The exclusion of non-adopters means that there is the premise that the innovation will be adopted and diffused by all

members operating in the social system. The S-curve perspective also denotes that there is a one-way adoption and diffusion process based on the time and rate of adoption. The assumption made by Rogers is that all new products/technologies follow a 'normal' distribution. Rogers meant that when an innovation is initiated in a social system it will be diffused and adopted by all and not re-invested or rejected. Rogers (1962) defined this critique as a pro-innovation bias. This means that the adopters follow the same route as an S-curve shape, where an innovation adopted is distributed normally at different percentage rates as shown in Figure 2.3. For example, Rogers (1962) cited an example of the diffusion of bottle-feeding to poverty-stricken mothers in the Third World countries of Latin America, Africa, and Asia. Although bottle-feeding (the innovation technology) was adopted and diffused, it also contributed widely to diarrhea in Third World countries, killing infants at a high rate. Pro-innovation bias means that there is a bias towards the need to diffuse technology without considering the consequences of the adoption of the technology as in the bottle-feeding example, which killed infants.

2.3.2 Individual Blame Biasness

The other issue raised was that change agents, who are organizational leaders, influence the behavior of early adopters as role models. Organizational leaders expect early adopters to be opinion leaders (advocates) and role models to convince the potential late adopters in a social system to adopt an innovation (see Figure 2.3). When an innovation fails, the early adopters are often blamed rather than other factors in the

diffusion process. Rogers (1962) argued that this constitutes individual blame bias because there is a "tendency of diffusion research to side with change agents who promote innovations than with audience of potential adopters" (p. 103). Rogers concluded that "a social system is a kind of collective-learning system in which the experiences of the earlier adopters of an innovation is transmitted through interpersonal networks, it determines the rate of adoption by their followers. Such as, 'learning by doing' in a social system could of course take a negative turn" (p. 67).

In other words, the social system includes both the system as an organization, the innovation to be adopted, and the individual adopters categorized based on their innovativeness (see Figure 2.3). Therefore, from a social system perspective, the system as a change agent does not operate in isolation; rather, it operates from a micro and macro level with prior experiences, which has an impact on social change, the organization, individual adopters, and the innovation technology. The point is, the structures of social systems form a boundary within which the individual operates and this boundary must be planned, organized, and clearly communicated to the opinion leaders to avoid blame biasness (Jacobsen, 1998; Samarawickrema & Stacey, 2007).

2.3.3 Equality in the Diffusion of Innovation

Rogers (1995) argues that equality in the diffusion of innovation is influenced by social systems as organizations through their socioeconomic status and social structures

(See Figure 2.1). According to Rogers, change agents introduce innovation into the social system. Change agents often have high socioeconomic status in the organization, as they are generally highly educated, have more knowledge about the innovation, and have more power and control as far as their social structures are concerned. The social structure refers to the mandates or norms of the social systems that bounds and changes the behavior of individual adopters in the organization in which they operate. Consequently, adopters as members of the social system do not equally diffuse the innovation process. Rogers meant that those with more power and control, or those who are highly educated, or economically sound, with good communication networks, are more cosmopolitan or international at least within a democratic system, or are able to cope with uncertainty could rapidly adopt an innovation and diffuse it through the system. Therefore, early adopters generally consist of those whose socioeconomic status is higher than late adopters. It is from this perspective that Rogers argues that individual adopters as members of the social system do not equally adopt the diffusion of an innovation. For instance, in the bottle-feeding example, multinational corporations promoted bottle-feeding to Third World countries but not all mothers adopted the innovation in the system. The diffusion of technology (bottle-feeding) negatively affected infants in the Third World (Rogers, 1962). The multinational corporations (change agents) were interested in the rapid adoption and diffusion for immediate results without considering the consequences within the system.

The early criticisms identified and reviewed by Rogers and Shoemaker (1971) from the 1,500, diffusion research studies were expanded by recent studies of Jacobsen

(1998), and Samarawickrema and Stacey (2007). Jacobsen's (1998) argument captures the thrust that Rogers' theory is assumed to be universal to all situations, yet adopters are different and all situated within diverse social systems, hence demographic factors such as age, qualifications, experiences, and gender are varied. Jacobsen suggests that although the rate of adoption is plotted as an S-curve of normal distribution and categorizes adopters based on percentages (such as innovators 2.5%, early adopters 13.5%, early majority 34%, late majority 34%, and laggards 16%), within each percentage adopters will behave differently in different contexts.

In addition, a study by Samarawickrema and Stacey (2007) claims that Rogers' theory does not include both physical and intangible complex objects. They suggest Actor-Network Theory as an alternative with the argument that the Actor-Network Theory treats all humans and non-humans as equals because the social world is materially heterogeneous. The reason for Samarawikrema and Stacey to have used Actor-Network Theory was to also include other factors that support and or impede the diffusion and adoption process, which have been excluded by Rogers' theory. They argue that these other factors "consist of a complex network of several human and nonhuman actors who interact and negotiate among themselves and impose roles on each other" (p. 317). Thus, their critique focuses on the fact that Rogers' theory (2003) focuses solely on technology and excludes environmental and external conditions.

Despite the above criticisms, Rogers' (2003) DoI theory remains popular in many disciplines. It has informed research on the adoption and diffusion of innovation

technology in higher education, on teaching and learning as a change process and also on the implementation and institutionalization of educational and instructional technology innovations in higher education. Rogers' (2003) theory has also influenced and generated other instructional technology theories and models such as the Concerns-Based Adoption Model.

2.4 How Diffusion of Innovation Theory has influenced Macro and Micro Theories

The purpose of this section is to describe how Rogers' (2003) theory has influenced instructional technology models. According to Surry (1997) instructional technology developers, like members of all disciplines, approach diffusion research from both a macro and micro level approach. Surry (1997) categorized the Macro level as Systemic Change Theories and the Micro as Product Utilization Theories of diffusion. The first section starts by describing the two major categories of instructional technology macro and micro theories, and secondly describes four instructional technology models, to show how Rogers's DoI theory has influenced these models.

2.4.1 Categories of Instructional Technology Theories

The focus in this section is on describing the two major groups of theories: Systemic Change theories (Macro) and Product Utilization theories (Micro). The macro theories have been seen as technological determinist; while the micro theories have been called instrumentalist theories (Surry, 1997). It is important to understand that:

> Macro or Systemic Change theories focus on the environment as a system where technology is driving the change, whereas the Micro or Product Utilization theories believe in understanding the potential adopter as guiding change in the organization in which they operate (Surry, 1997, Macro and Micro Theories, para. 16 & 17).

2.4.1.1 Macro Theories

Several studies have been conducted that have used the innovation diffusion theories to understand the adoption process in their education systems. For instance, "a number of researchers have attempted to use the general theories of innovation diffusion to develop diffusion theories specific to the field of instructional technology" (Surry, 1997, Instructional Technology Diffusion Theory, para. 15). According to Surry, macro theories "focus on widespread reform and the restructuring of educational institutions" (Macro and Micro Theories, para. 16) through the adoption of technology. In these theories, technology drives organizational change. Systemic Change theories "typically involve the adoption of a wide range of innovative technologies and practices. Because of their broad scope, systematic change theories can be thought of as macro level instructional technology diffusion theories" (Micro and Micro Theories, para. 16). An example of a Systemic Change theory is the New American Schools Development Corporation (NASDC), which is a systematic widespread approach to introducing technology to increase student performance (Bodilly, Keltner, Purnell, Reichardt, & Schuyler, 1998 as also note by Surry, 1997).

2.4.1.2 Micro Theories

According to Surry and Farquhar (1997), Micro or Product Utilization theories focus on product adoption in different contexts. In these theories, the emphasis is on the product or the specific implementation of the product in a specific context. Examples are the User-Oriented Development process (Burkman, 1987), Adoption Checklist (Farquhar & Surry, 1994), Environmental Analysis (Schneberger & Jost, 1994), Adoption Analysis (Stockdill & Morehouse, 1992), and Technological Imperative Models (Tessmer, 1990). These are not concerned with large scale, systemic change, but focus on the adoption of specific innovations and specific environments (Surry, 1997). Micro theories:

> are not concerned with large scale, systemic change, but focus on the adoption of a specific innovation by a specific set of potential adopters because of their focus on specific innovations and specific environments, these theories are, in effect, micro level information technology diffusion theories (Surry, 1997, Macro and Micro Theories, para. 17).

In summary, it is important to understand that Macro or Systemic Change theories focus on the environment as a system where technology is driving the change, whereas the Micro or Product Utilization theories believe in understanding the potential adopter as guiding change in the organization in which they operate. In addition, based on macro and micro theories, researchers have further defined these theories from a determinist and instrumentalist approaches, respectively (Surry, 1997; Surry & Farquhar, 1997).

2.5 Determinist and Instrumentalist

Surry (1997) argued that, theoretically, perspectives on technology "range on a continuum from technological determinism to technological instrumentalism" (Surry, 1997, Determinist versus Instrumentalist, para. 19). The key differences between the two ends of the continuum are autonomy and continuity:

> Technological determinists view technology as an autonomous force, beyond direct human control, and see technology as the prime cause of social change. Determinists view the expansion of technology as discontinuous. They see technological growth not as a gradual, evolutionary process, but as a series of revolutionary leaps forward (Surry, 1997, Determinist versus Instrumentalist, para. 21 & 23).

According to Surry, determinists view technology differently as bringing changes to human behaviors, similar to changes created by institutions. They believe that it is "evil" but that it is superior in directing changes (Determinist versus Instrumentalist, para. 23).

In opposition to determinists are instrumentalists, who view technology as a tool that can be controlled by humans (Surry, 1997). They claim that technology as a tool can be used like a "knife" for "good or evil" depending on the intentions of the user (Determinist versus Instrumentalist, para. 23). Instrumentalists also believe that social conditions and human desires are the means for change and not technology itself (Surry & Farquhar, 1997). Technology adoption here is seen as a gradual evolutionary process that is slow to be implemented and used by potential adopters in the social system.

Concisely, determinists view technology as superior, beyond human control, and determining changes in the system, whereas instrumentalists view technology as a tool that is controlled by the user. Instrumentalists believe that the adoption and diffusion of an innovation is an evolutionary process, which gradually expands in the system through potential adopters (Surry, 1997; Surry & Farquhar, 1997). Instrumentalists also claim that the environment in which the individual adopter operates needs to be understood because the change made by the adopter is within a social system. It was based on these ideas that researchers further categorized determinist and instrumentalist from an organization systemic change larger scale a developer-based and individual adopter-based in a specific context approaches, correspondingly.

2.5.1 Developer-Based (Determinist) and Adopter-Based (Instrumentalist) Theory

Surry (1997) subcategorized the macro and micro theories into developer-based and adopter-based theories, respectively. Developer-based theories are premised on the belief that technology determines changes to the system from a larger scale: systemic change,

> The underlying assumption of developer-based theories is deterministic in its belief that superior technological products and systems will, by virtue of their superiority alone, replace inferior products and systems. Developer-based theories of diffusion see change as following directly from a technological revolution (Developer Based (Determinist) Theory, para. 25).

Developer-Based or Systemic Change theories assume that technological superiority brings change in the education system from a top down approach (Surry, 1997). An example of developer-based theories is instructional design models, which "assume that technological superiority leads to the adoption and diffusion of innovative products and practices" (Surry, 1997, Developer Based [Determinist] Theory, para. 27). In other words, Surry argues that the system or organization from a macro approach makes changes with technology by instructing the adopters, hence the top-down reformation.

Adopter-based theories, in contrast, focus on the human and interpersonal aspects of innovation diffusion. They view the end-user as key in adopting and implementing the innovation in context, and as the primary force for change (Surry, 1997). Adopter-based theories can be found in both the Macro and Micro categories of instructional technology diffusion research. For example, Burkman (1987) was the first major author of Micro Product Utilization theory. His User-Oriented Instructional Development process "is based on instrumentalist views of instructional technology" (Surry, 1997, para. 36). He rejects the idea of technological superiority as the basis for the adoption of an instructional product. Burkman focused on the potential adopter's opinions, perceptions, and needs as the primary forces that influence adoption and change. These adopter-based theories seek to understand the individual adopters and the social system in which the innovation is implemented and used (Surry, 1997).

Adopter-based theories see diffusion from a bottom up approach whereby the potential adopter ultimately implements the innovation by understanding the environment in which he/she operates (Surry, 1997). These adopter-based theories are examples of a Macro (Systemic change) theory of diffusion that is instrumentalist, rather than determinist such as Hall and Hord's (1987) Concerns-Based Adoption Model, in philosophy (Surry, 1997). According to Surry, the "idea of Hall and Hord's Concerns-Based Adoption Model is to bring about the systemic restructuring by understanding the social, political, and interpersonal aspects of the school" (Surry, 1997, Adopter Based (Instrumentalist) Theory, para. 38).

In conclusion, Surry and Farquhar (1997) argue for an instrumentalist approach to instructional development macro theories that the diffusion and innovation of a product in educational systems will always be a slow evolutionary process and not a revolutionary process as viewed by determinist philosophers. The end user is the focus as changes are implemented and used by them. The end user is part of the adoption and implementation process of products and systems influenced by technological determinist and instrumentalist philosophies (Surry & Farquhar, 1997).

Therefore, understanding Rogers' (2003) DoI theory and Surry and Farquhar's (1997) application of diffusion theory to instructional development will guide this study in exploring the experiences of technology among early adopters in the transition from classroom f2f to distance and online education in universities using print and online media.

2.6 Rogers' Theory and Instructional Technology Models

The work of Rogers in relation to the diffusion of innovations has informed most of the research studies in the field of innovation technology adoption (Burkman, 1987; Carr Jr., 1999; Ellsworth, 2000; Surry & Brennan, 1998; Surry & Farquhar, 1997) in the past century. This section focuses on the description of three key instructional technology models developed in response to Rogers' DoI theory as significant examples and how the general diffusion theories have influenced them. Several key models have moved beyond determinism to instrumentalism in response to Rogers' theory.

2.6.1 Technology Adoption Model

Davis' (1986) Technology Acceptance Model was based on Rogers DoI theory. It was developed in 1986, modified again in 1989, and further developed by Venkatesh in 2000. Davis initially had two variables: perceived ease of use, perceived usefulness, and in 2000, a third variable, behavioral intention, was added. The model posits that the individual's intention to use was the single best predictor of actual system usage. The purpose of the Technology Adoption Model was to predict and explain user acceptance of a new technology (Davis, 1986). Perceived usefulness is related to the individual's beliefs, values, needs, and attitudes, similar to Rogers' (1962) innovation technology's compatibility concept, whereas perceived ease of use refers to how easy it is to use the technology without applying much effort. This is similar to Rogers' complexity concept. Behavioral Intention refers to the individual's intention to adopt the technology, which is similar to Rogers' concept of adopter innovativeness. The Technology Adoption Model's

three variables resemble those of Rogers' (2003) attribution of innovation such as compatibility, complexity, and adopter innovativeness.

2.6.2 Concerns-Based Adoption Model

The Concerns-Based Adoption Model was initiated in 1973, developed further in 1987, modified in 2001, updated in 2006 and 2011 by Hall and Hord, and updated again in 2014. In 1979, Hall and Locks, six years after the 1973 initiation of Concern Based Adoption Model, further developed the model in a similar and supporting way. The model was developed to deal with school changes in education systems as a result of introducing technology for teaching and learning. The model deals with the individual from the micro level concerns of people affected by change and how they learn about this change within organizations from a macro level. Hall and Hord (2014) claim that change is a process not an event; thus, it takes place over time, an idea that is similar to Rogers' (2003) views. It is therefore, important to understand the concerns of people affected by change from their personal perspective.

The Concerns-Based Adoption Model is a conceptual framework describing, explaining, and predicting probable teacher concerns and behaviors through the change process in a school environment. Hall and Hord's (1987) model focused on the adoption of an innovation from a behavioral intention perspective. Hall and Hord (2011) argue that the change agent is one who facilitates change in schools, while Rogers (2003), in contrast, argues that a change agent initially introduces an innovation from a macro-level

to the potential adopters at a micro level in a social system. The Concerns-Based Adoption Model is an example of a Macro (Systemic Change) theory that is instrumentalist rather than determinist in its philosophical roots (Surry, 1997). The literature shows that the diffusion and adoption of an innovation from an individual teacher's concerns in the context of school (Hall & Hord, 2011) is affected by change, whereas Rogers' (2003) views on change involve both individual concerns and behaviors interacting with the organization as members of the social system.

2.6.3 Resources, Infrastructure, People, Policies, Learning, Evaluation, and Support Model

Surry (1997) built on Rogers' theory to address organizational changes in an education system in general and in higher education in particular. However, Ely (1990, 1999) conducted several studies based on DoI concepts that investigated facilitating factors for the successful adoption and implementation of innovations and identified eight conditions: dissatisfaction with the status quo, sufficient knowledge and skills, resources, time, rewards and incentives, participation, commitment, and leadership. He argues that these eight conditions are important for change to be implemented following the diffusion and adoption of an innovation. In 2002, Surry developed a model for integrating instructional technologies into higher education that is the Resources, Infrastructure, People, Policies, Learning, Evaluation, and Support (RIPPLES) model. Surry, Ensminger, and Jones (2003), used this theory called the RIPPLES model after consideration of Ely's eight conditions for addressing organizational change. It was from

this basis that Surry, Ensminger, and Jones (2007) used Ely's conditions and identified seven elements from the survey they conducted with Deans in higher education focusing on Rogers' Diffusion of Innovation theory and factors affecting the implementation of an innovation.

The authors of the RIPPLES model resonate with the views of the Systemic Change or Macro Theories of diffusion, as they are instrumentalist rather than determinist in philosophy. They focus on understanding both the organizational change inclusive of the individual Deans as end users implementing the innovation operating in the same system. The seven factors identified are relevant to Rogers' social system, compatibility and early adopters components, because the Resources, Infrastructure, People, Policies, Learning, Evaluation, and Support model was developed based on the diffusion of innovation theories and the process of its development involved the adoption and diffusion process from a social systems perspective, based on individuals' compatibility to technology adoption as early adopters.

The models and theories discussed above show that instructional technologies have been influenced by Rogers' DoI theory. Since Rogers' theory can be used either in Systemic Change or Macro Theories and/or Product Utilization or Micro Theories, it is adaptable to many disciplines, contexts, and circumstances. Rogers claims that an organization from a macro level cannot operate in isolation; thus, it must include individuals from a micro level as members of the social system for social change.

Rogers' (2003) theory expands on the views of Product Utilization Theories by creating an understanding that the end users as adopters operate in the organization as members of the social system in which they operate and can influence the diffusion process for social change. He claims that the adoption and diffusion of technology innovation is based on the interaction of the organization with individual adopters as members of the social system. Therefore, it is important to understand the system from a macro to a micro level operating in the same social system for a common goal, as they influence each other. Three of Rogers' theoretical concepts are discussed below as the main conceptual framework for this study.

2.7 Conceptual Framework for this Study

In review, Rogers' three key components of the theory influenced this study: the concept of social systems, the idea of compatibility of technology, and the categorization of early adopters as described above. Rogers (2003) claims that innovation is diffused through a population in a social system based on key attributes such as compatibility by early adopters. He focused on the social system from a macro level, the organization, as well as the individual adopters – the micro level. Rogers' views based on these three concepts resonate with the researchers of instructional technology models, which were developed through his (1962, 1995, 2003) DoI theory. The instructional technology models with micro and macro theories, therefore, are discussed below synthesizing their particular concepts to Rogers' three conceptual frameworks specifically to guide this study.

The Technology Adoption Model by Davies (1986), and further developed by Vankadesh in 2000, as was described above, is similar to Rogers' views as noted in the previous section. In addition, the Concern Base Adoption Model (Hall & Hord, 2006, 2014) is also similar insofar as its focus on school changes in education system from a macro larger scale but zeros in on concerns of individual adopters and their level of behavior in using innovation technologies as change agents from a micro level perspective. But Rogers viewed the change agents as social systems (as an organization) from a macro level not avoiding the fact that individual adopters from a micro level bring change based on the changes by the organization. Rogers' theory can be used from a macro, social systems as a larger scale, or micro level, focusing on individual adopters as people. In relation to this study therefore, the concept of 'People' from Surry (2002), Surry, Ensminger, and Jones (2003) Resources, Infrastructure, 'People', Policies, Learning, Evaluation, and Support model is similar to the views of Davies (1989), Hall and Hord (2014) about the claim that individual adopters from a micro level perspective also influence the adoption and diffusion of innovation technologies in the system from a macro level, which further resonates with Rogers' three concepts that guide the present study.

The emphasis of this study is on 'People' as change agents on how the micro (People), from an instrumentalist view (adopter-based) approach towards the organization (university) is influenced or affected the macro larger scale of a systemic change, which is the organization (university), into adoption and diffusion of technology referred to as a determinist (developer-based) approach. On this basis therefore, of all the above theories:

(developer-based), instrumentalist (adopter-based), instructional technology models (Technology Adoption Model, Concern Based Adoption Model, and Resources, Infrastructure, 'People', Policies, Learning, Evaluation, and Support model) have common views, which resonate with Rogers' (2003) three conceptual frameworks. This study focuses on how the 'People' as early adopters from a micro systems instrumentalist adopter-based bottom-up approach can bring the evolution or change in to the social system a larger scale of top-down determinist developer-based systemic change approach. On this basis, Rogers's theory is discussed below in the context of higher education using his three conceptual frameworks focusing on 'People' as individual adopters from a micro level perspective bringing change as change agents based on social systems mandates through which they operate as early adopters.

2.8 Rogers' Theory in Higher Education

The purpose of this section is to discuss studies that have used Rogers (2003) Diffusion of Innovation (DoI) theory in universities relevant to this study. Several studies have used general diffusion theories of technology innovation building on Rogers' theory in adopting and diffusing an innovation technology in higher education systems from a macro and/or a micro level (e.g. Carr Jr., 1999; Less, 2003; Reid, 2007, 2009; Surry & Brennan, 1998; Surry, Ensminger, & Jones, 2003).

In spite of the technology introduced in universities by administrators as change agents for teaching and learning, lecturers have different experiences in teaching and in the use of technology, which impacts the adoption and diffusion process of technology innovation in universities. The purpose of this section is to discuss literature from the context of higher education on the use of Rogers DoI theory (2003). The literature is organized into three conceptual themes based on Rogers' (2003) DoI theory: early adopters as lecturers; the attributes of an innovation, such as compatibility for the purpose of this study; and the social system, referring to the university in which early adopters operate.

2.8.1 Early Adopters

Numerous studies have used Rogers' (2003) early adopter categories in exploring the adoption and diffusion of technology innovation in social systems (universities) (Hixon, Buckenmeyer, Barczyk, Fieldman, & Zamojski, 2012; Jacobsen, 1998; Keesee & Shepard, 2011; Less, 2003; Laronde, 2010). The influences of early adopters' experiences of technology, teaching, and learning in universities were also explored (Less, 2003; Laronde, 2010; Martin, Prosser, Trigwell, Ramsden, & Benjamin, 2013; Samarwickrema & Stacey, 2007). The following common factors were identified from the literature and are discussed below, namely, characteristics, experiences, and beliefs.

The category of early adopter is commonly used in studies because these are the individuals who directly communicate through interpersonal channels with their peers or late adopters to adopt the technology in the system in which they all operate (Giardna, 2010; Martin, Prosser, Trigwell, Ramsden, & Benjamin, 2013; Reid, 2009; Sahin, 2006). It emerged from the literature that early adopters are potential leaders (role models), and are often unique in adopting and diffusing technology innovation in the system.

Early adopters tend to adopt technology earlier than others in the system. Thus, identifying early adopters and targeting them is an effective approach to innovation diffusion (Bates, Manuel, & Oppenheim, 2007; Birch & Burnett, 2009). Birch and Sankey (2008) argue that early adopters persuade other potential adopters in the diffusion process. According to Hixon, Buckenmeyer, Barczyk, Fieldman, and Zamojski (2012), early adopters are influential in their use of instructional technology. Early adopters can change the behavior of other potential adopters. They are generally more open to and have more teaching experience with the use of technology as compared to others in the system. Early adopters are often highly respected locals and potential leaders who can easily change the behavior of their peers through interpersonal communication channels in the system. They often demonstrate to peers how they use technology in teaching and learning. Thus, early adopters, play a critical and unique role in the diffusion process as members of the social system and as part of a change agent.

Jacobsen (1998) argues that early adopters are unique. They are unique because they take risks, and are willing to experiment with and use the technology. They are able

to solve difficult tasks related to the new technology. Late adopters, in contrast, resist technology adoption. Jacobsen (1998) argued that, "because of their different levels of computer use and years of experience, each early adopter appeared to have a unique innovation-decision cycle" (p. 166). For example, some use the internet for classroom demonstrations, while others published on the web, or required students to post online. In this case, early adopters are convinced of the benefits of web-delivered instruction and see it as an enhancement to f2f instruction. As a result, Jacobsen claimed that early adopters are different from others in the system in the way that they make decisions about adopting and using technology, hence Rogers called them heterophilous (different from each other) and others are homophilous (similar to one another).

Evidence from other studies confirms that early adopters are different from their peers (Laronde, 2010). Less (2003) concludes that early adopters are often agents of change. According to Reid (2007), early adopters are sometimes experts in the field. Early adopters are often more experienced in technology, teaching, and learning than their peers in the same system with a faster rate of adoption (Jacobsen, 1998).

Early adopters are experienced users of technology in teaching and learning (Jacobsen, 1998). This experience affects their attitudes. For example, studies have observed that early adopters are technologically more experienced and have more positive attitudes towards technology (Jacobsen, 1998; Laronde, 2010; Samarawickrema & Stacey, 2007; Shea, et al., 2005). Researchers revealed that teachers' experiences, attitudes, and beliefs towards technology influence the successful integration of

innovative technology (Jacobsen, 1998; Samarawickrema & Stacey, 2007). Teachers' attitudes towards technology influence their acceptance of the usefulness with technology and its integration into teaching (Jacobsen, 1998; Samarawickrema and Stacey, 2007). For example, a study by Samarawickrema & Stacey (2007) found that "participants who had a more open attitude to online technologies tended to experiment and be more willing to consider uptake of technology" (p. 327).

Jacobsen (1998) reported that: "faculty comments provide evidence that the integration of technology supports a shift from a primarily 'knowledge-transfer' mode of content delivery to a more 'knowledge-construction' type of teacher-student interaction" (p. 172). The point made by Jacobsen relates to the experiences of academic teachers in teaching and the use of technology where academic teachers acknowledge the fact that their f2f mode of teaching changes. The use of technology changes, shifts and/or transforms their role of teaching from teacher-centered, that is, knowledge transfer to student-centered, where the knowledge is constructed by learners through teacher-student interaction.

Early adopters believe that the use of technology in teaching and learning makes their work easier, allowing them to interact more easily with learners and build social networking communication channels (Reid, 2007). For example, Jacobsen (1998) found that some early adopters believed that they could become better teachers by using technology. Several studies reviewed found that early adopters believed in the use of technology in teaching and learning (Reid, 2009; Samarawickrema & Stacey, 2007).

Beliefs in the value of technology also affect the motivation of early adopters (Jacobsen, 1998, 2000). Early adopters' belief in the value of technology motivates them to further their technological expertise. For example, Jacobsen (2000) conducted a study in a Canadian university to investigate the relationships between excellent teachers and early adopters of technology. She found that early adopters believed that an individual as a technology expert is different from someone with pedagogical skills. Jacobsen observed that this does not mean that technology can improve teaching and learning skills, because some early adopters cannot apply their technological expertise in teaching and learning. On the other hand, the most interesting result of her study was that excellent teachers were eager to integrate technology into their teaching because they were motivated and influenced by innovators.

According to Jacobsen (1998, 2000), early adopters have intrinsic belief structures that integrating technology into their teaching is the right thing to do. In sum, some early adopters are convinced that technology cannot improve poor teaching, whereas others believe it can solve their problems. According to Jacobsen (1998) "early adopters believe in their ability to solve difficult problems if they try hard enough and invest the necessary effort, and are confident about their ability to deal efficiently with unexpected events" (p. 164). Yohon and Zimmerman (2006) reported that although opportunities to learn technology through workshops and seminars were available to lecturers, early adopters preferred more informal learning opportunities such as talking to other faculty members. Similarly, Martin, Prosser, Trigwell, Ramsden, and Benjamin (2013) argued that although training was provided on the use of technology, early adopters preferred interacting with

peers in order to learn to use technology. Reid (2007) claims that early adopters preferred using social media when they interact with others as peers in a system.

2.8.2 Compatibility of Technology

The purpose of this section is to discuss studies that have used Rogers' (2003) DoI theory in the context of compatibility as a specific concept. According to Akir, Butcher, and Tsao (2003), ideas that are not compatible with the normative standards and values of a given social system are not adopted as rapidly as those that are compatible. In retrospect, compatibility of technology refers to the technology that is relevant to the context (system), needs, beliefs, values, and experiences of individual adopters (Rogers, 2003). The needs of potential adopters may vary by the position they hold within the department. One of the Akir, et al (2003) respondents described her need to advance the knowledge and skill capacity of the graduate teaching-assistants under her charge by saying that:

> I train future teachers if I can't do that (use ICT) then I don't have a job... they (her students) are going to go and get a job...they're (potential employers) going to ask them, okay what do you know about technology? That's the question and not because they want to test them. They (potential employers) don't know the answer. They want to make sure the person they are going to hire knows the answer because they don't know anything (Akir, et al. 2003, p. 5).

Akir et al. (2003) supports the idea that the degree of compatibility and innovation processes correlates with the level of behavior changes an innovation requires. Once the

innovation's potential is observable and shown to be compatible with the needs of adopters, diffusion occurs (p. 5). Studies claim that when the attributes of technology innovation such as compatibility are high the adoption process is effective (Birch & Burnett, 2009; Keesee & Shepard, 2011; Samarawickrema & Stacey, 2007). The following common factors were identified from the literature and are discussed below: perceived attributes, technology self-efficacy, and workload.

Although there are criticisms of the perceived attributes (relative advantage, compatibility, complexity, observability, and trialability) of technology, the concept of perceived attributes has been broadly used in higher education research to determine individual early adopters' perceptions in the diffusion of innovation technology process (Bennett & Bennett, 2003; Birch & Burnett, 2009; Keesee & Shepard, 2011; Li & Lindner, 2007; Sherry, 1998; Wilson, Sherry, Dobrovolny, Batty, & Ryder, 2002). This concept has also been criticized as limited because of its focus on technology, which excludes environmental and external conditions (Ely, 1990, 1999; Stockdill & Morehouse, 1992; Surry, 1997; Wilson, Sherry, Dobrovolny, Batty, & Ryder, 2000). Many of these studies conclude that attributes of technology were rated very highly by early adopters. For example, Samarawickrema and Stacey (2007) conducted a study in a large Australian metropolitan university to explore the adoption of Learning Management Systems. The findings revealed that the attributes of technology, especially the relative advantages and compatibility, were very high, which influenced the participants' rate of adopting and diffusing an innovation in the system.

Research shows that academic teachers adopt and diffuse technology innovation if it is compatible with their beliefs, values, experiences, needs, knowledge, competencies, skills, organizational support, rewards/incentives, and teaching and learning (Birch & Burnett, 2009; Samarawickrema & Stacey, 2007). For example, a study conducted by Keesee and Shepard (2011) in an American university aimed to determine instructors' perceptions of the five attributes of a Course Management System used in order to predict adopter status. They concluded that faculty in the different adopter categories had different perceptions in adopting and using Course Management System. The authors claim that,

> Early Adopters are willing to try new technologies and are not adverse to an occasional failure. Therefore, Course Management System would seem to be compatible with the early adopters' level of technology expertise and experience because they are more technologically savvy in the first place (Discussion, para. 27).

Although early adopters are experienced in teaching and in the use of some technology, studies have noted that there are those who resist being early adopters because they do not want to change the teaching methods, preferring to use the same traditional modes of f2f to online teaching (Jacobsen, 1998). Laronde (2010) found that professors who were using computers said the internet was unreliable and too slow to be used in class. Many also commented that they would not be able to move around in a classroom with 40 B.Ed. students using laptops plugged into electrical outlets.

Research has been conducted on academic teachers' self-efficacy, and results have shown that it has an impact on the adoption and diffusion process. Self-efficacy is defined as a belief in one's own abilities to perform an action and/or activity to meet goals (Jacobsen, 1998). Bandura (2010) defined self-efficacy as personal judgments of one's capabilities to organize and execute courses of action to attain designated goals, and he sought to assess its level, generality, and strength across activities and contexts. Self-efficacy of early adopters, then, is the confidence, competency, and capability to use technology for teaching and learning.

For instance, Jacobsen (1998) concluded that early adopters' computer self-efficacy is generally higher than that of late adopters. Early adopters have high self-confidence, competencies, and the ability to solve challenging problems, and they do so by taking risks. It was reported in studies that early adopters adopt and diffuse technology innovations earlier than their peers in the same system because they believe they are capable and have the ability to use technology in teaching due to high self-efficacy (Birch & Burnett, 2009; Jacobsen, 1998; Keesee & Shepard, 2011; Moore & Benbasat, 1991).

Studies have revealed that the workloads of teachers influence their acceptance of technology in classrooms (Samarawickrema & Stacey, 2007). For example, Samarawickrema and Stacey investigated factors related to the use of Learning Management Systems in a large multi-campus urban university in Australia. They found that increased workload coupled with teaching and technology was critical to the

participants of the study. The consequences of increased workload negatively affected the technology diffusion process. Several studies revealed that the use of technology increases workload when developing learning materials, and when all students can access technology individually and send more than one email to the lecturer (Laronde, 2010; Less, 2003; Shea, et al., 2005; Samarawickrema & Stacey, 2007). For example, Samarawickrema and Stacey claimed, in their research, that early adopters' workload was increased by technology. Early adopters tend to use many of the features in Learning Management Systems, for example, and the resulting overload is sometimes difficult for them to manage. Dealing with student posts and responses was also overwhelming.

Early adopters have found that more preparation time for developing learning materials and using technology in teaching and learning was also required. Time was also consumed by a lack of technical support (Samarawickrema & Stacey, 2007). Similar results have been found by researchers in K-12 school systems where teachers were overloaded by the amount of time required to learn how to use technology, prepare learning materials, and teach classes while integrating the technology (Neyland, 2011). Heavy workload for early adopters reduces the rate of the technology diffusion process. For the diffusion process to be effective, there is a need to plan, organize, and manage the time for each individual early adopter. For example, Birch and Burnett (2009), in their study of academics claimed that some early adopters found it easier to just update the printed materials, which they were familiar with using, rather than using technology, because it increased their workload.

2.8.3 Social Systems

The social system as described in the previous section is a system within which organizations and early adopters adopt, diffuse, and use the technology (Less, 2003; Samarawickrema & Stacey, 2007). Social systems have structures set within a boundary in which innovation diffusion takes place. Unlike the description of social systems in the previous section, the purpose of the present section is therefore, to discuss studies that have used Rogers theory (2003) in detail identifying factors relevant to this study that have shaped social systems, thereby influencing the adoption and diffusion of technology innovation by early adopters.

Several factors relating to social systems such as structures, mandates, training, professional development, planning, organization, management, and communication networks influence the adoption and diffusion of technology in universities (Less, 2003; Martin et al., 2013; Shea et al., 2005; Surry, Ensminger, & Haab, 2005; Surry, Ensminger, & Jones, 2007). The themes that emerge from these studies include organizational characteristics, professional development, technical support, infrastructure and accessibility, leadership support in technology, change agents, decision-making, and communication channels. The two social systems factors most commonly reported by studies that impacts on the diffusion process are discussed here: organizational characteristics and professional development.

Studies focusing on organizational characteristics that influence the adoption of technologies in higher education identified factors that describe organizational characteristics such as policies, leadership, support, strategic planning, standards, and change agents as barriers to early adopters adopting an innovation (Less, 2003; McLean, 2005; Surry, Ensminger & Haab, 2005; Surry, Ensminger, & Jones, 2003). The focus is on the most commonly cited characteristics of an organization, which are policies, change agents, and professional development.

Samarawickrema and Stacey (2007) observed that institutions often shape the actions of innovation adopters. They identified institutional policies as having an impact on how technology is adopted. The organizational structures are used by administrators representing the system to guide and change early adopters' behavior towards the adoption and diffusion of technology for social change. For example, in the study conducted by Samarawickrema and Stacey the participants commented that there were no clear policies to guide them, and this led to tensions and conflicts. Further, "participants could not identify university- or faculty-level policies that addressed key concerns such as career paths, work guidelines, and workloads, which impacted on their responses related to technology adoption by the teaching academics" (p. 329).

Similarly, Surry, Ensminger, and Jones (2003) presented a paper where the results from questionnaires on their Resources, Infrastructure, People, Policies, Learning, Evaluation, and Support model were sent to college deans. The authors argued that higher education policies were developed before technology was implemented in the

workplace and as a result the policies served to prevent or inhibit the adoption and diffusion processes. Also, the failure to include early adopters in the initial stages of policy development and a lack of clear policy statements and standards likewise resulted in academics resisting technology adoption (Birch & Burnett, 2009; Laronde, 2010). According to Keesee and Shepard (2011), organizational policies and procedures should be reviewed in order to better facilitate technology experimentation. They noted that faculty felt that the system should allow them to try out and test the technology innovation such as electronic learning to facilitate a more effective adoption process.

Less (2003) found that "faculty members and presidents or other members of the senior administration are seen as change agents in leading the efforts to facilitate the adoption of technology" (p. 99). According to Laronde (2010), change agents are people in organizations who use structures to guide and change early adopters' behaviors and encourage them to adopt and diffuse an innovation. Change agents in a system are socially and technically advanced when compared to those they intend to change. Change agents also often develop strategies that encourage and motivate early adopters to adopt a technology innovation by offering rewards or incentives, open communication channels for feedback, support or training, and the ability to access the technology (Jacobsen, 1998).

Several studies observed that interpersonal communication channels, as compared to mass communication networks, speed up the amount of time needed to adopt and diffuse an innovation technology in a social system (Jacobsen, 1998; Reid, 2007). What

this means is that an organization as a change agent, by introducing the technology innovation in the system, uses a mass communication channel, which does not influence the late adopters as compared to early adopters. Early adopters communicate to their peers through interpersonal relationships at the same level, which increases the late adopters' rate of adoption by allowing them to learn from each other from a social perspective on how technology is used. It is; therefore, important to understand the role of an organization as a policymaker, change agent, and professional developer in which the individual early adopters operate by influencing the adoption process.

Studies have observed that professional development promotes and facilitates the adoption and diffusion of technology innovation (De Gagne & Walters, 2009; Macy, 2007; Samarawickrema & Stacey, 2007). Samarawickrema and Stacey found that participants required different levels of training because they were at different levels of technology adoption in their online courses. The study concluded that training and professional development stimulated academic teachers' interest and their willingness to experiment, boosted their confidence, and led to promoting adoption. Berliner (1992), cited in Jacobsen (1998), argued that, "those in leadership positions on campus, administration, deans, department heads, should perhaps focus support and training efforts on developing competent performers rather than striving to create a whole cadre of experts across campus" (p. 195). The following section focuses on two themes deduced from the literature, training and support for early adopters.

Although the research took place in the K-12 context, according to Buabeng-Andoh (2012) it showed that whether they deal with beginner or experienced technology users, ICT related training programs develop teachers' competencies in computer use and positively influence teachers' attitudes towards computers (Bauer & Kenton, 2005; Franklin, 2007; Hew & Bush, 2007; Keengwe & Onchwari, 2008; Wozney, Venkatesh, & Abrami, 2006). It was also observed that not all academic teachers have positive feelings about teaching online and continuous online training, support, and development helped alleviate these feelings. Therefore, it was necessary for the university to understand the differences in individual early adopter needs, beliefs, values, time, accessibility, experiences, and emotions such as fear, lack of confidence, resistance, and/or frustrations before teaching online courses to align them with the professional development and training programs. Research also shows that academic teachers preferred to learn from others in addition to the workshops provided (Martin, Parker, & Oyarzun, 2013). Studies have made recommendations for systems (organizations) to provide proper training programs to support learning on how to use technology in teaching and learning (Keesee & Shepard, 2011). Studies have identified support factors that influenced early adopters and the diffusion process in a system such as organizational, technical, and personal support (Cheung & Huang, 2005).

The organization supports early adopters from a technical and personal level (Cheung & Huang, 2005; Keesee & Shepard, 2011; Less, 2003; Martin et al., 2013; Shea et al., 2005). Organizations usually initiate the adoption and diffusion of an innovation in the system through mass media communication channels. They use mass media as an

efficient means to inform the audience of potential adopters about the existence of an innovation, creating awareness-knowledge. Mass media channels include mediums such as radio, TV, and newspapers, enabling a source or a few individuals to reach an audience of many adopters within the same system and others outside the system about the innovation, even at the university. They expect early adopters, who often act as role models, to diffuse the innovation within the boundaries of the system's structure and to socially change the behavior of their peers. It is, therefore, important as an organization to provide clear boundaries, system structures, administrative support, and clear mass media communication channels to early adopters at the initial stages when an innovation is introduced.

It is important for an organization to provide technical support to early adopters when the need arises. Early adopters need to be assisted to access the technology, use the technology effectively, and be given support when the technology breaks down (Keesee & Shepard, 2011; Samarawickrema & Stacey, 2007). Keesee and Shepard (2011) recommended that, "organizations provide systematic technical support for the maintenance of the Course Management System (CMS)" (Recommendations for Action, para. 45) on time, because if repairs and maintenance are not done within specific periods of time the rate of the diffusion process slows down.

Early adopters need time to be able to learn to use and practice the technology in teaching and learning. It was revealed in Samarawickrema and Stacey's (2007) study that web-based teaching significantly shapes early adopters' learning time. The time refers to

how much allowance the early adopters, in these case lecturers, have to adopt and diffuse technology innovation in the system for teaching and learning. For instance, a lack of time for learning and integrating ICT has been noted in many studies (Samarawickrema & Stacey, 2007). A study by Birch and Burnett (2009) found that "individual inhibitors to the development of e-learning formats included lack of time, increased academic workloads and perceived failure by the institution to provide time relief" (p. 124). The early adopters in an organization need to be personally supported in their work to be able to adopt and diffuse technology innovations in the systems. The adopters individually need time to be able to learn about the new technologies introduced to them by the system, how to use them in teaching and learning, how to incorporate their teaching and technology experiences in the system, and to learn from their peers (Jacobsen, 1998; Samarawickrema & Stacey, 2007). The individual adopters find it better and easier to socially interact through interpersonal communication channels with those at the same level in the social system (Martin, Parker, & Oyarzun, 2013; Reid 2007).

In summary, research shows that it is important for organizations to understand individual early adopters' beliefs and perceptions from the compatibility perspective in order to positively influence the adoption rate. Otherwise, if adopters' experiences, needs, and values are not compatible with how the early adopters perceive the innovation, it will not be adopted. The social system's structures should be strategically planned in line with the innovations' attributes such as compatibility and early adopters' perceptions to facilitate the adoption and diffusion of technology innovation (Birch & Burnett, 2009; Jacobsen, 1998).

Themes were identified from the literature context such as professional development, faculty support, time management, academic teaching role changes, teaching strategies, planning, implementation reflection, and individual, organizational, and technological factors (Chiasson, Terras, & Smart, 2013; De Gagne & Walters, 2009; Macy, 2007; Johnson, 2008; Redmond, 2011; Vyas, 2010).

2.9 Chapter Summary

There are various diffusion of innovation theories and models as explained above. It was noted that most of these models and theories of diffusion of innovation were developed based on Rogers' DoI theory (2003). Although Rogers' theory has been criticized and used in different contexts, it continues to be studied in relation to universities across the globe in order to explore the adoption and diffusion of technology innovation in systems. In places such as Europe, North America, Australia, New Zealand, Asia, and Africa, Rogers' ideas are used to understand specific concepts of diffusion, including social systems, compatibility, and early adopters.

This chapter reviewed Rogers' DoI theory (2003) to understand the context in which the study was conducted and how the experiences of technology in the transition process were influenced by lecturers teaching courses and programs offered in the university from f2f to distance education using media such as print and online. According to Rogers' theory, the adoption and diffusion of an innovation is based on the

characteristics of the adopters when interacting from both a micro to a macro level as members of the social system. Furthermore, who the adopters of a technology will be is based on the decisions they make, the attributes of the innovation, and the elements of the innovation because they each differently influence the adoption and diffusion process.

The literature and theory on the experiences of technology among early adopters in the transition process substantiated that eLearning, ICTs, and educational technology are important as they facilitate making university courses and programs offered accessible to the community at large. For instance, researchers claim that when lecturers are not supported in the implementation process of a technology they resist the technology by not adopting it in their pedagogy (Bates, 2000, 2005a, 2008; Beggs, 2000; Hardaker & Singh, 2011; Lane, Lyle III, 2011; Whitworth, 2011).

The current study focuses on how experiences of technology among early adopters influence the transition from f2f to distance education to online learning at the University of Botswana. I have used Rogers' DoI (2003) theory to understand the study, and the focus was on the three components noted above: compatibility of technology, social systems, and early adopters. An extensive literature review was conducted to find out what has been done in this area and to identify gaps, which will be addressed in this study. The following chapter describes in context theoretical perceptions with related literature, focusing on the adoption and diffusion of technology innovation in higher education in the African university context, including Sub-Saharan Africa, and references the University of Botswana as a case study.

CHAPTER 3 – LITERATURE REVIEW: CONTEXT OF THE STUDY

3.1 Overview

This chapter discusses the adoption and diffusion of technology in teaching and learning in higher education in Africa, including Sub-Saharan Africa and particularly Botswana. First, technology in higher education in Africa is described. Second, studies are reviewed on the adoption of technology innovation in Africa. A relevant review of the literature on early adopters of technology in universities in Africa is discussed to complement the earlier discussion in a critical and informative manner. Third, the literature on Botswana with reference to the University of Botswana is discussed. Finally, the literature on the transition process from classroom education with f2f delivery to distance education, and then to online learning is reviewed.

3.2 Technology in Higher Education in Africa

The aim in this section is to describe the use of technology in higher education in Africa, such as internet users, ICT policies, accessibility, and infrastructure in universities. According to Farrell and Isaac (2007), countries in Africa are different from each other in the application and implementation of ICT policies and infrastructure for education. They claim that South Africa is able to move its ICT agenda forward, similar to the way in which countries of North Africa that have resources and high bandwidth connectivity to Europe have been able to. Ghana, Mauritius, and Botswana were also identified as countries moving steadily forward and making remarkable progress in ICT.

Farrell and Isaac also mentioned another group of African countries, which are consistently facing conflict and economic instability, such as Malawi, Rwanda, Somalia, Senegal, Algeria, and Nigeria. These countries need more assistance with ICT.

According to Farrell and Isaac (2007), universities are expected to lead in the process of integrating ICT in education. Universities are experiencing a paradigm shift in changing education systems to use technology, whether they deliver a single and/or dual mode: f2f, blended distance education, or online learning. Many universities are facing challenges, for example, regarding the type of students to be admitted. These students are usually scattered both throughout rural and urban areas and need to access university courses and programs wherever they are, irrespective of geographical distance. It is important for the universities to implement technologies into their systems so that these students can access their available programs from any distance.

It was also noted that print-based distance education was a predominant tool in the distance education system in African universities, including Sub-Saharan Africa, with reference to Southern Africa in particular, since this has proved to be an easier method of deployment (Dodds, Nonyongo, & Glennie, 2002; Haughey, Murphy, & Muirhead, 2008; Mpofu, 2005). The main hindrances that have been identified as facing African education systems are a lack of infrastructure, a lack of accessibility, a lack of networking, high telephone and internet costs, limited expertise and skills, and a lack of enabling national policies (Adeya, 2001; Farrell & Isaacs, 2007; Farrell, Isaacs, & Trucano, 2007; Isaacs, 2007; Ojuloge & Awoleye, 2012; Schachter, Pence, Zuckernick, & Roberts, 2005). The

three identified themes from the review of the literature were found to have shaped the diffusion process: policies, accessibility, and infrastructure, are the focus of this discussion on understanding the status of technology in universities in Africa especially Sub-Saharan Africa.

3.2.1 Policies

Policies on ICT are used to guide the adoption and implementation of ICT in higher education for each African country. According to Farrell and Isaac (2007), national ICT policy is used to develop a comprehensive education ICT policy in most African countries. As Onyango (2000) noted, policy developments had always been a problem in Africa and tended to fail because there was no continuity or review of policy processes. Onyango further noted that African countries tend to adopt ideas from others and often do not make them compatible to their context, and policies fail as a result. Ojuloge and Awoleye (2012) asserted that appropriate policy directions should guide governments to promote public and private investors in ICTs.

Researchers claim that if a policy on technology is not clear, is not communicated to adopters, or is lacking implementation processes, the adoption and diffusion process of innovation technology decreases or is not adopted (Kajuna, 2009; Masalela, 2011; Ojoluge & Awoleye, 2012; Totolo, 2007). Studies acknowledge the fact that policies specifically developed for technology such as ICT are used to guide the adoption and

diffusion process in the system. Mtebe and Raisamo (2014), for example, reported that the majority of Tanzanian institutions do not have institutional policies and at least four main national policies need to be reviewed for the smooth implementation of Open Educational Resources (OER): intellectual property rights and copyright policy, human resource policy guidelines, ICT policy, and materials development and quality assurance policy. This means that if the ICT policies are clearly communicated by the organization (university policymakers), involving all those affected in the university system, such as early adopters in its initial developmental stages, the rate of adoption and diffusion of the technology innovation process could increase. This increase results in the easy accessibility of available technology in the higher education systems.

3.2.2 Accessibility

In order for technology to be adopted and diffused in the system it has to be easily accessible and available for use by individual adopters. For example, a study from a school context was conducted by Chigona and Chigona (2010) and explored factors preventing teachers from using ICT in teaching Khanya schools in South Africa. They reported that inadequate training, the lack of access to computer laboratories, and inadequate technology resources discouraged teachers from implementing ICT into their teaching. Although it is a study from a school context, the principles and standards still apply in all learning institutions such as colleges, tertiary, vocational, secondary, junior, primary, and kindergarten schools. Technology can be available and not accessible to use

or can be accessible and not available to use; this means that even if the system is well resourced with good infrastructure it does not mean that individual adopters will be able to easily access the available technology (Kyakulumbye, Olobo, & Kisenyi, 2013). The authors meant that the accessibility of technology goes hand in hand with the knowledge and skills of adopters who must be knowledgeable, skillful, and able to use technology for teaching and learning. Accessing ICT infrastructure and resources in universities is necessary for the integration of technology in education systems. If students are not able to access technology, academic staff will not be able to apply the use of technology in the system, even though it is available and accessible to them. For example, Agbonlahor (2006) conducted a study in a Nigerian university to understand the characteristics of the use of information technology and factors that influence the use of information technology among lecturers. The results revealed that when lecturers have access to the technology they tend to use it more, which increases the adoption and diffusion rate in some universities in Africa. Agbonlahor (2006) also noted that, "Level of access to computers significantly influenced both frequency of computer use and number of computer applications used by the lecturers in this study" (p. 273).

3.2.3 Infrastructure

Farrell and Isaac (2007) argued that there is a huge gap between urban and rural regions in Africa in terms of access to ICT infrastructure. They reported that there is a shortage of electricity in countries in North Africa and Mauritius, and while South Africa

is an exception, it still has an unequal supply of electricity between rural and urban areas. According to Perrlson and Sunders (2006), as cited in Kyakulumbye, Olobo, and Kisenyi (2013): ICT infrastructure refers to everything that supports the flow and processing of information in an organization, including hardware, liveware, software, data and network components (p. 24).

Information and communication technology was referred to as the actual standalone computers, networked or interconnected computers, remote access, internet, websites, intranet and extranet, and electronic data interchange (Kyakulumbye, Olobo, & Kisenyi, 2013). If the computers, specifically the internet, are available and not connected, that is, if infrastructure is lacking, the technology adopters will not be able to use and access them. Several studies have reported that the lack of infrastructure in university systems hindered and/or slowed down the adoption and diffusion process by adopters in the system (Chigona & Chigona, 2010; Kituyi & Tusubira, 2013; Kyakulumbye, Olobo, & Kisenyi, 2013; Mtebe & Raisamo, 2014). Kyakulumbye, Olobo, and Kisenyi (2013), from an Uganda Christian university context, claim that even when organizational support, ICT infrastructure, and accessibility of technology are in place there is still a need for strategies to help improve the adoption process.

Although Botswana was ranked lower based on the three indicators in 2007, Gillwald and Steve (2005) in their study based on ICT e-Index results compared to other Sub-Saharan Africa countries revealed that Botswana ranked high on the effective implementation of ICT. The reason was that Botswana had good policies and regulatory

practices. This shows that Botswana had technology infrastructural problems because from 2007, Botswana ranked lower because it could not provide internet to all 100 inhabitants, although in 2005 it had implemented good policies and regulatory practices. For example, a study conducted by Sebusang, Masupe, and Chumai (2005) in Botswana revealed that broadband access was not within the reach of the population at large. They concluded that the overall accessibility of telecommunication was very low in Botswana.

In another study, Sanou (2014) found that only one out of ten households in Africa were connected, meaning that by the end of 2014 only 44% of households had internet access at home compared to 78% in the developed world. According to Ojuloge and Awoleye (2012); Internet Usage Statistics for Africa, (2016), Africa is still lagging behind on internet usage (see Table 3.1). In Ojuloge and Awoleye study, they purposively selected five African countries to represent various parts of Africa in terms of size, socio-economic development, telecommunication infrastructure, geographical location, and internet connectivity and usage. The aim was to compare Egypt with North Africa, Nigeria from the West, Kenya from the East, Rwanda from Central Africa, and South Africa from the South in terms of results and explain the differences in their rate of adoption and diffusion of internet technology.

In addition, the reports provided in Table 3.1 are based on Internet World Statistics as of June 30 2016. The global distribution of the number of internet users shows that Africa represents 16.0% of the world's population, but only accounts for less than 9.8% of worldwide internet users (Ojuloge & Awoleye, 2012). Similarly, Internet

Usage Statistics for Africa (2016) reports Africa representing the world population of 16.2% but with low internet use at 9.4%. These findings showed that "economic strength, telecommunications and technology infrastructure, and number of internet hosts in the observed countries play a fundamentally important role in determining diffusion rates of Internet technology" (Ojuloge & Awoleye, 2012, p. 5). This means that the internet adoption and diffusion rates are different per the five selected countries in the study. Based on the selected variables, it was reported that internet costs and connectivity affect the adoption and diffusion process in the system. The internet spreads across all the regions of the world but the adoption and diffusion of internet technology is less in Africa, and is reported as 9.3% as compared to Europe at 16.7% and North America 8.7% (see Table 3.1).

The literature on Africa reports low levels of technology and connectivity because of low socio-economic status and concomitant technology difficulties. Not all countries are the same; some have the conditions for more technology adoption than others such as internet usage (see Table 3.2). Table 3.2 reports internet users in the 14 selected African countries, especially those in Southern Africa and neighboring countries to Botswana. The Table 3.2 reveals that in Southern Africa: Mauritius, South Africa, and Zimbabwe are rated as having high indicators of internet users per population compared to Botswana, which is rated as having low indicators and is ranked among the low users of internet. This means that Botswana has numerous infrastructural gaps compared to other Sub-Saharan African countries, particularly in internet-use. Botswana's population was 2,209,208 out of which internet users per inhabitants was indicated as 620,000,

representing a lower number of users as compared to other Southern Africa countries such as Mauritius and South Africa per population, showing high indicators of internet users for these countries.

However, in 2016 as noted on Table 3.2, Botswana's population was among the lowest, but the penetration percentage population was high in Botswana (28.1%) when compared to countries with high populations showing low percentage penetration like Malawi (6.1%), Namibia (21.2%), Tanzania (14.9%), Zambia (18.0%). On the other hand, Mauritius population was lower than Botswana's but its internet penetration percentage per population was very high (60.0%) and even higher than that of South Africa (49.0%).. Farrell and Isaac (2007) concluded that countries in Africa with high ICT use have good infrastructure like Mauritius and South Africa. Briefly, internet use in Botswana was low in 2007 but gradually increased between 2014 and 2016 as noted on Table 3.2 compared to other Sub-Saharan Africa countries specifically in Southern Africa.

Table 3.1

World Distribution of Internet Users - (Internet Usage Statistics for Africa, June 30 2016).

World Regions	**2016 Population % of the World**	**Penetration % of the Population**	**Users %**
Africa	16.2	28.7	9.3
Asia	55.2	45.6	50.2
Europe	11.3	73.9	16.7
Latin America/Caribbean	8.5	61.5	10.5
Middle East	3.4	57.4	3.8
North America	4.9	89.0	8.7
Ocean/Australia	0.5	73.3	0.8
World Total	**100.0**		**100.0**

Source: Internet World Statistics – www.internetworldstats.com/stats.html, June 30 2016

Table 3.2

Africa 2016 Population and Internet users Statistics for 2016 in Africa from selected countries

Africa	Population	Internet Users	Penetration (% Population)	Internet % - Africa
Angola	20,172,332	5,951,453	29.5	1.8
Botswana	2,209,208	620,000	28.1	0.2
Lesotho	1,947,701	250,000	12.8	0.1
Malawi	17,715,075	1,080,620	6.1	0.3
Mauritius	1,339,827	803,896	60.0	0.2
Mozambique	25,303,113	1,503,005	5.9	0.5
Namibia	2,212,307	470,000	21.2	0.1
Nigeria	181,562,056	92,699,924	51.1	28.0
South Africa	54,777,809	26,841,126	49.027.1	8.1
Swaziland	1,435,613	389,051	14.9	0.1
Tanzania	51,045,882	7,590,794	32.1	2.3
Uganda	37,101,745	11,924,927	18.0	3.6
Zambia	15,066,266	2,711,928	47.5	0.8
Zimbabwe	14,229,541	6,759,032		2.0

Source: Internet World Statistics – www.internetworldstats.com/stats.html, June 30 2016

3.3 Studies on the Adoption and Diffusion of Technology Innovation in Africa

Technology is being adopted and diffused in education systems to improve accessibility and infrastructure, and implement educational reform. Several studies on the adoption and diffusion of technology innovation in African universities have reported that even if technology infrastructure is in place, accessible, and available, some of the experienced adopters of technology and teaching are not able to use technology in the system (Krishnakumar & Kumar, 2011; Kyakulumbye, Olobo, & Kisenyi, 2013). Research has been conducted on technology diffusion using Rogers' theory in African universities in Sub-Saharan Africa. The following themes were identified from the literature and resonate with Rogers' theory: policies, accessibility, infrastructure, economy, and training. The themes were evidenced under relevant studies guided by Rogers' conceptual framework: social systems, compatibility of technology, and early adopters. The purpose of this section is to review studies that focused their research on the adoption and diffusion process of technology innovation in universities of Africa. In addition, the focus is on studies that have used Rogers' conceptual framework to address issues impacting the diffusion process in the system, such as policies, accessibility, infrastructure, and professional development, training, and experiences.

3.3.1 Social Systems

Research indicates that innovation characteristics similar to social factors such as individual and organizational factors (providing training and easy access to information technology) within any social system are important in the diffusion process because they influence the process. For the purpose of this study, policies and organizational support are discussed as common themes under social systems, which influence the diffusion process.

The organizational policies for technology guide the social factors such as individual and organizational factors to achieve a common goal in the diffusion process (Agbonlahor, 2006). The technology policies in the social system, such as in universities, are meant to facilitate and guide the implementation of technology innovation in a system by individual adopters to meet the objectives. Therefore, similar to United Kingdom, North American, and Australian researchers, as opposed to Africa, universities adopt and diffuse ICT policies. These ICT policies are developed based on national ICT policies to guide the individual adopters of technology in the system for teaching and learning. The early adopters in the universities make decisions as stipulated in social systems policies, which guides them through the social change. Early adopters' modes of teaching, behaviors, beliefs, needs, values, and experiences are influenced by the policies within the social system in which they operate. Kajuna (2009) argues that organizations like universities, when developing policies on technology innovations, should involve adopters in the initial stages of its development to make them aware of the university's

ICT policies, which should be clearly communicated to them as members of the social system.

Most organizations such as universities provide support to adopters of technology such as technical support, professional development and training, rewards, time management, and leadership for the successful adoption and diffusion of the technology innovation in the system (Mayoka & Kyeyune, 2012; Twinomujuni, 2011). In universities in the United Kingdom, United States of America, Canada, and Australia, researchers reported that academic teachers are supported and made aware of technologies to be used in the education systems in order to familiarize themselves with them, similar to African universities. In universities, technology adopters are professionally developed and trained, given access to workshops, encouraged to research and present papers at conferences, and to become familiar with the implementation of technology in other contexts.

The successful adoption, diffusion, and integration of technology innovation in the system by individual adopters is determined by appropriate and strategically organized professional development and technology training programs. The professional development offered to academic teachers develops their technology competencies, self-efficacy, confidence, and influences their attitudes toward the use of technology in teaching and learning (Krishnakumar & Kumar, 2011). A similar case, in the context of a Nigerian university, concluded that higher institutions should encourage old and young lecturers to be computer literate by organizing conferences, seminars, and workshops to

develop good attitudes toward the use of ICT for teaching and learning (Onasanya, Shehu, Oduwaiye, & Shehu, 2010).

Farrell and Isaacs (2007), as cited in Twinomujuni (2011), reported that although all of the faculty members of the Makerere University were trained and supported by the Faculty of Computing and Information Technology in e-learning technologies, only a few teachers had the skills to make pedagogical use of ICTs. The reason "could be due to inadequate ICT training skills, lack of time and negative attitude by teachers towards ICT implementation" (p. 19). Twinomununi (2011) recommended in his study that:

> To overcome the problem of poor and lack of skills in ICT, institutions of higher learning could be encouraged to employ a variety of teacher training methods, ranging from face-to-face workshops to online self study programs depending on training objectives and environments (p. 91).

Simelane, Blignaut, and Ryneveld (2007) acknowledged the fact that strategies and approaches need to be put in place to facilitate lecturers at Tshwane University of Technology in South Africa to integrate educational technology into their teaching and learning practices. They indicate that a professional development program should be strategically designed and supported by management and academic staff to promote the use of technology in the university, including capacity building, design and development, implementation, and research. Similarly, Mayoka and Kyeyune (2012) conducted a study examining e-learning information systems failures and adoption problems in Ugandan universities based on Rogers and Shoemaker's (1971) Diffusion of Technology Innovation Theory. Makerere University Business School was used as a case study for

surveying two e-learning systems. The authors recommended that, "universities should work towards improving knowledge and skills of students and staff through training in order to increase chances of technology acceptance to users as had been suggested by Rogers and Shoemaker" (1971, p. 7). Similar to researchers in United Kingdom, North American, and Australian universities, and compared to African universities, researchers acknowledge the need to support technology adopters in teaching and learning in the form of training and professional development (Buabeng-Andoh, 2012; Kajuna, 2009; Nyirongo, 2009; Obiri-Jehoah, Kwarteng, & Kyere-Djan, 2013; Twinomujuni, 2011).

The main issue that was observed by most researchers was that although training, workshops, and professional development were provided to academic teachers, they were not allowed enough time to learn how to use the technologies introduced to them. They were expected to be able to use them right away as introduced to them and this negatively impacts the adoption and diffusion process. Academic teachers in an African university context differ from those in United Kingdom, North American, or Australian universities in that although they are supported through professional development or workshops, they often fear and have 'technophobia' about using technology for teaching and learning (Totolo, 2007). This fear and technophobia negatively impacts the adoption and diffusion rate of technology innovation as members of the social system in which they operate.

3.3.2 Compatibility of Technology

This section focused on the experiences of early technology adopters' use of technology to facilitate teaching and learning. Agbonlahor (2006) investigated levels of information technology use by Nigerian university lecturers in order to understand the characteristics of the use of information technology and factors that motivate the lecturers to use information technology. She used Rogers' (1995) DoI theory, focusing on two of the components, the characteristics of the innovation itself and the characteristics of the social system in which the individual adopter exists. She found that perceived usefulness and perceived ease of use significantly influenced the use of information technology by lecturers in Nigerian universities. This means that the early adopters, as members of the social system, whether in Africa or another outside system such as the United Kingdom, North America, or Australia, adopt and diffuse technology in the system, provided it is compatible with their experiences, values, needs, beliefs, and is simple, or easy to use in teaching and learning. Studies have observed that the attributes of technology influence the diffusion process in the system when high or low (Agbonlahor, 2006; Chigona & Dagada, 2011; Obiri-Jeboah, Kwarteng, & Keyere-Djan, 2013; Twinomujuni, 2011). Although technology was available and accessible, adopters of technology in universities in Africa find it hard to use technology in teaching and learning. Their experiences were often not compatible to the new technologies in the system, and students mostly do not access the available technology for use based on various reasons such as costs, lack of electricity, and lack of skills and knowledge on how to use some specific tools associated with the technology

3.3.3 Early Adopters

Early adopters are reported as experienced in technology, teaching, and learning; thus, they are assumed to adopt and diffuse technology innovation at a higher rate compared to other peers as members of the social system in which they all operate (Agbonlahor, 2006). For example, Tshabala, Ndeya-Ndaya, and van der Merwe (2014), in one of South Africa's universities, revealed that teachers with more years of teaching had strong computer skills, lead to a higher rate of adoption, whereas the teachers with fewer years of teaching experiences with fewer or no computer skills, lead to low rates or resistance in adopting the innovation technology.

Krishnakumar & Kumar (2011) claim that teachers with experience in using computers and those who own computers have favorable attitudes towards eLearning. Teachers who own computers at home and have access to computers in the institution are familiar with technology and thus can easily adopt, integrate, and diffuse technology innovation in their teaching and learning experiences. In the context of Africa, at times users or adopters, even when they are aware of the potential benefits, are not ready or are unwilling to fully embrace the ICT (Obiri-Jeboah, Kwarteng, & Kyere-Djan, 2013). As mentioned, it was observed that some adopters of technology innovation in universities are technophobic. They had fear of using technology for teaching and learning, lack knowledge and skills, and were not aware of technology policies; thus far, university policymakers and administrators initiated and introduced the new technologies without

involving them. Some technology adopters in universities such as lecturers', tend to use technology in teaching when they have been exposed to it in advance through training or workshops, and had used it before. Agbonlahor (2006) claimed that lecturers who own computers tend to use the technology more, hence the adoption and diffusion process increases in the system. Lecturers in the African university context prefer to use technology that is compatible to their teaching experiences. In the United Kingdom, North America, and Australia, academic teachers are keen to apply their teaching and learning experiences in web-based learning, whereas in the context of Africa, academic teachers find it difficult to apply teaching experiences using technology.

In conclusion, the reviews from African universities when compared to the United Kingdom, North America, and Australia showed that there are similarities and differences as far as the adoption and diffusion of technology innovation is concerned. Studies demonstrated that policies are generally developed from the national ICT policies to guide the diffusion process. Generally, in African universities the ICT policies are not communicated accordingly to the system and thus have a negative impact on academic teachers' use of technology.

The other point noted from the studies was that the lecturers from the African context are often technophobic because of the challenges they are faced with, such as a lack of infrastructure, and not being able to access technology. Although they can access the available technology for teaching and learning, it is not compatible with their

experiences, beliefs, needs, and values and they end up applying their f2f teaching experience, which is predominantly print-based.

The studies reviewed concluded that early adopters' experiences of technology in teaching and learning were focused more on f2f with less technology. The lecturers were more comfortable with using their teaching experiences over web-based learning as compared to United Kingdom, North American, and Australian lecturers. It is important to now explore the experiences of academic teachers in a university context with reference to Botswana, as a gap found in the previous studies.

3.4 The Case of Botswana

The purpose of this section is to review specific literature on Botswana with specific reference to the University of Botswana as a case study, which used Rogers' DoI theory. The focus is on the experiences of technology among early adopters in the transition from f2f teaching to online learning delivery methods.

A key study on teaching in higher education in Botswana was conducted (Mutula, (2002). According to Mutula, e-Learning technology was introduced in 1999 and implemented at the University of Botswana in 2001 to enhance and facilitate teaching and learning for effective modes of learning, similar to other African countries. The University of Botswana implemented eLearning: ICTs to promote web-based learning. Uys (2003) noted that "the focus on eLearning at University of Botswana was therefore a

blended approach in which various modes, methods and media were integrated and organised for appropriate learning" (p. 5). When eLearning was introduced at the University of Botswana it was predominantly a blended learning approach where f2f delivery with print-based materials was used with the intention of using online technologies. Mutula (2002) further said that lecturers were trained to provide them with skills and knowledge in eLearning.

There are limited studies conducted in Botswana using Rogers' theory; notable examples are Masalela (2006, 2009) and Thomas (2008). One of the studies by Totolo (2007) used the Technology Adoption Model by Davies (1989), which is similar and relevant to Rogers' theory. There was a further significant study on transitions across technology (Masalela, 2011). The studies were chronologically reviewed from 1999 to the present, which enabled me to understand the progress and the development of the adoption and diffusion of eLearning such as ICT, instructional technology, or educational technology at the University of Botswana.

Of the few studies that have been conducted since 1999 to the present date, some did not use Rogers' theory, such as Masalela (2011) and Totolo (2007) which have been elaborated on but are relevant to the study, since they reported on the successful adoption and diffusion processes and also challenges such as a lack of clear policies, a lack of technological infrastructure, a lack of accessibility and availability, organizational support, a lack of professional training, role changes, large classes, and increased workload (Masalela, 2006, 2009; Thomas, 2008). These benefits and challenges

identified in the use of technology in education in Botswana studies are evidenced in the following reviews.

The purpose of Masalela's (2006) study was to qualitatively examine, through a case study approach, factors that influenced faculty members' decisions to participate in online learning at the University of Botswana. The findings of this study suggested that the adopters were intrinsically motivated to teach online courses while non-adopters noted personal needs and extrinsic motivations for participation. The researcher concluded that a lack of policy, reward structure, release time, and faculty needs could prevent faculty members from teaching online courses at the University of Botswana. The study recommended ongoing training, a comprehensive "one-stop" shop for assisting online students with all the transactions, release time to learn and integrate new technology, rewards for faculty who teach online courses, clear online learning policies, technical and instructional support, and more SMART Boards in f2f classrooms. The University of Botswana's commitment to address the issues of resources and the continued support of faculty and open communication could increase the likelihood of overcoming identified barriers and ensure the faculty's continual participation in online learning.

In another study, Totolo (2007) investigated the likelihood of computer technology adoption in Botswana among school principals in secondary schools, who were assumed to be transformational leaders. These leaders were expected to implement the technology innovation in schools as mentors to teachers. They were the leaders who

would transform the school systems by introducing computers for teaching and learning. The Technology Acceptance Model survey and an interview were used to determine the perceptions of the school principals about accepting and using computer technology. The survey was used to predict and explain the principals' acceptance of computers in relation to whether they found them useful, easy to use, and if they intended to adopt and use them. The results showed that time constraints, phobias, a lack of skills or training, and a lack of practice with computers were identified as barriers to adoption in this study. The results of the study confirmed that the research population was not homogenous; there were early adopters, who showed characteristics of transformational leadership as well as late adopters and non-adopters who were still learning how to use computers. Therefore, it was recommended that training on the use of computers should include strategies to alleviate barriers to computer adoption.

The purpose of Thomas (2008) research study, conducted from 2005 to 2007, was to provide some insights into the progress of University of Botswana since the integration of instructional technology in teaching and learning. The study included statistics on online courses and designers at the University of Botswana from 2002 to 2007, and conducted interviews with ten lecturers and three key members of Educational Technology. The theme of Thomas' study was the growth of technology innovation at the University of Botswana from 2002 to 2008. He focused on managing change towards a blended learning model. Thomas used various diffusion of innovation change theories, models, and strategies to determine the progress achieved since the adoption of eLearning technology at the University of Botswana. He found that although eLearning was

implemented, only a few lecturers adopted and diffused it, similar to Rogers' (2003) findings, with innovators at 2.5% and early adopters at 13.5%. Thomas identified strategies to be used to increase the adoption and diffusion of eLearning technologies at the University of Botswana. Some of the strategies identified by Hall and Hord's (2006, 2014) Stages of Concern model to assess lecturers' personal concerns and Elys's (1990, 1999) eight conditions for successful technology implementation and training lecturers were used in conducting lecturer surveys. Thomas (2008) recommended that change management require a team approach: top-down, bottom-up, and inside out for its success. In addition, he said that the use of innovative technology, supported teaching approaches, regular formative evaluation, time to be allocated for research and the use of technology should be considered to facilitate the diffusion and adoption process of technology innovation in the university.

Thomas's (2008) views were similar to Masalela (2006) and Totolo's (2007) in that he suggested using strategies to increase the adoption and diffusion process of eLearning at the University of Botswana. Strategies included further training and for time to be allocated to use the technology. He emphasized that early adopters should be used as mentors in the system, and similar to Masalela (2011) made recommendations that management should use the Leadership, Academic, and Student Ownership and Readiness model "for technological transformation in tertiary education guided the implementation and selection of appropriate strategies" (Uys, 2001, in Uys (2003, Using a Map for Technological Transformation … Para. 3). According to Masalela (2011), LASO model, "it integrates top-bottom and bottom-up initiatives where leadership

incorporates with academic" (Abstract, para. 1) for its success, involving everyone in the system to work as a team. Thomas (2008) also suggested that there should be a clear reward structure and infrastructure. One notable point he mentioned was that intellectual property should be clearly addressed and for lecturers to own their materials.

Masalela's (2009) qualitative study examined factors that influenced faculty members' decisions to use blended learning at the University of Botswana. She used Rogers' (2003) DoI theory to interpret the findings, focusing on attributes of innovation: relative advantage, compatibility, complexity, trialability, and observability. Masalela found that early adopters experienced benefits as a result of using blended learning such as improved pedagogy, engagement in learning, and flexibility. Both adopters and non-adopters experienced some challenges and concerns, including the need for time to learn how to use and integrate technology, a lack of equipment, large classes, a heavy workload, a lack of technical support and training, the lack of a policy for online/blended learning, a lack of incentives, and poor management. She concluded that there is a need for a paradigm shift that needs strategic leadership and good decision-making from the University of Botswana through planned, organized and managed systems for transformational change to promote blended learning.

Masalela's (2011) paper articulated "the flaws attributed to lack of a comprehensive institutional strategy for eLearning and a framework that is based on shared vision with all the stakeholders at the University of Botswana" (p. 4). Masalela noted that the University of Botswana is undergoing transformative changes in response

to internal and external responses in higher education. She used a Masters in Project Management course as a focus for her study in the transition process from f2f delivery to online learning. The university attempted to transition towards online learning to enhance educational experiences by offering the Masters in Project Management course, a course typically offered f2f. Findings revealed that due to a top-bottom approach, the piloted Masters in Project Management course failed. The University of Botswana piloted the Masters in Project Management course, which was offered to f2f students and distance education learners online. The lecturers resisted. They were ultimately against the idea of implementing online learning. Their reasoning was that since the course is offered full time, distance education learners should attend this full time course.

In addition, the lecturers felt that the University of Botswana administration did not involve them in the initiation of the program to be offered online. The other issues were the lack of a comprehensive institutional strategy based on a shared vision, facilitator attitudes, user preparedness, pedagogical issues, a lack of commitment and ownership, and the design and the implementation, which the eLearning lecturers felt was imposed on them. Masalela (2011) suggested that the transition to online learning must be done gradually, and the University of Botswana needed online learning, teaching, and strategic management that articulated policies and plans for implementation. Comprehensive training initiatives should also be implemented.

The above studies had common views on the issue of adoption and diffusion process, similar to the challenges identified related to technology for education in

Botswana. They indicated there was a lack of training, lack of time to learn and integrate technology in teaching and learning, a lack of technology infrastructure, a lack of leadership support, technical support, accessibility and availability of technology in the system, as well as policy issues on technology and online learning (Masalela, 2006, 2009, 2011; Thomas, 2008; Totolo, 2007). These studies also demonstrated the need for strategies to be developed for the system to enable an effective and efficient diffusion process such as better organization, planning, teamwork, and clear communication channels within the system.

In summary, many universities inclusive of the United Kingdom, North America, and Australia compared to Africa are offering f2f courses through blended distance education to fully online learning. This shows that many universities are in the transition and transformation process, with courses being taught through both modes of delivery. Universities from all contexts generally adopt and diffuse technology innovation for teaching and learning to facilitate the accessibility and availability of their courses and programs locally, nationally, and globally. The lecturers in these universities display differences in adopting technologies; there were those who were more innovative than others based on their experiences as early adopters and those who were late adopters who resisted adopting technologies due to their needs, values, experiences, and beliefs.

Common factors have been identified from the research that affect the adoption and diffusion process of technology in universities both from the context of Africa and Botswana particularly such as technology infrastructure, accessibility, availability,

professional development and training, role changes, workload, large classes, technology policies, and support (organizational, leadership, technology, and individual) (Agbonlahor, 2006; Masalela, 2009, 2011; Mtebe & Raisamo, 2014; Twinimujuni, 2011). The following section explores the experiences of technology adopters in the transition from teaching traditional f2f courses to online learning in universities.

3.5 Technology Adoption and Diffusion in the Transition Process

3.5.1 Overview

Studies have generally reported that universities are experiencing a paradigm shift, whether as a single and/or dual mode institutional transition or by moving from f2f delivery to distance and blended to online learning (Bates, 2007). It was generally noted that there were different modes of teaching, such as f2f, blended, and online learning (Chiasson, Terras, & Smart, 2013; Johnson, 2008; Keengwe, & Georgina, 2011; Redmond, 2011; Vyas, 2010). This process facilitated the accessibility of available courses and programs that use technology in teaching and learning, as noted in Figure 3.1, which clearly defines the differences of these modes of delivery.

Nunan, Reid, and McCausland (2002) conducted a case study describing current developments in the change process undergone by the University of South Australia in developing from a dual mode to a flexible delivery mode for all its courses and programs. They claim there were three modes (f2f, distance, and online) of teaching and learning that used technology, involving a shift that was teacher-centered, utilized distance

education, and was learner centered (see Figure 3.1). They further argue that there is a shift from teacher-centered f2f to distance education to online learning. They said that student-centered learning was facilitated by the use of ICT that enabled them to control their learning. Figure 3.2 uses different terms such as f2f, blended learning and distributed learning.

In Figure 3.1 Nuan et al. (2002) noted that f2f can be used without eLearning but can still be called blended because of the use of classroom aids such as computers and internet in the classroom. Chiasson, Terras, and Smart, (2013) and Vyas (2010) argue that synchronous learning happens when teacher-student and student-student interaction are engaged at the same time and in the same online space, whereas, asynchronous learning is where the interaction happens at different times and through online spaces. The authors meant that f2f and online learning or fully online or mixed with technology in f2f is as noted in Figure 3.2. Similarly, universities globally are going through changes and transformations in their modes of teaching and learning for flexible learning, where courses and programs are offered through three modes as is noted in Figure 3.1.

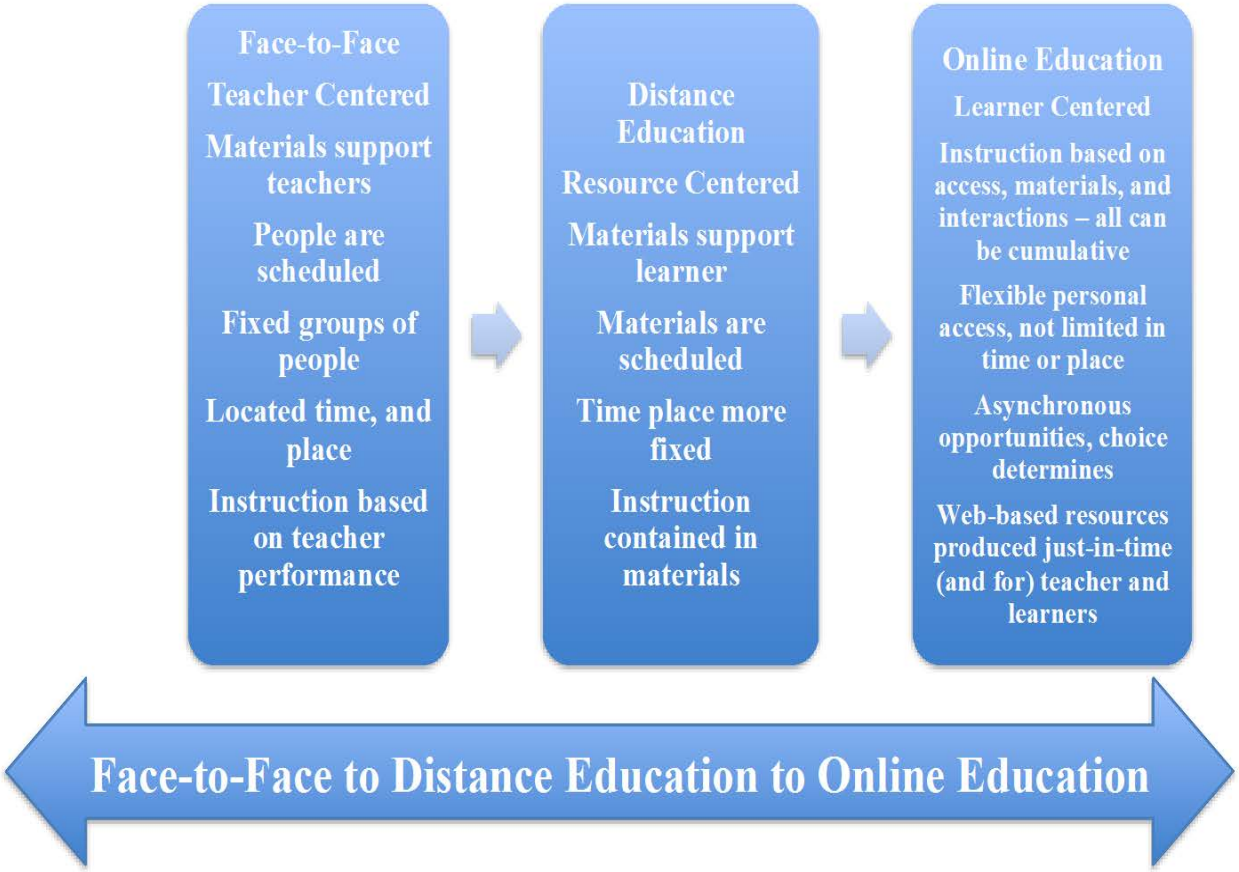


Figure 3.1. Key Characteristics of Different Modes of Learning

Source: Adapted from Nunan, Reid, and McCausland, 2002

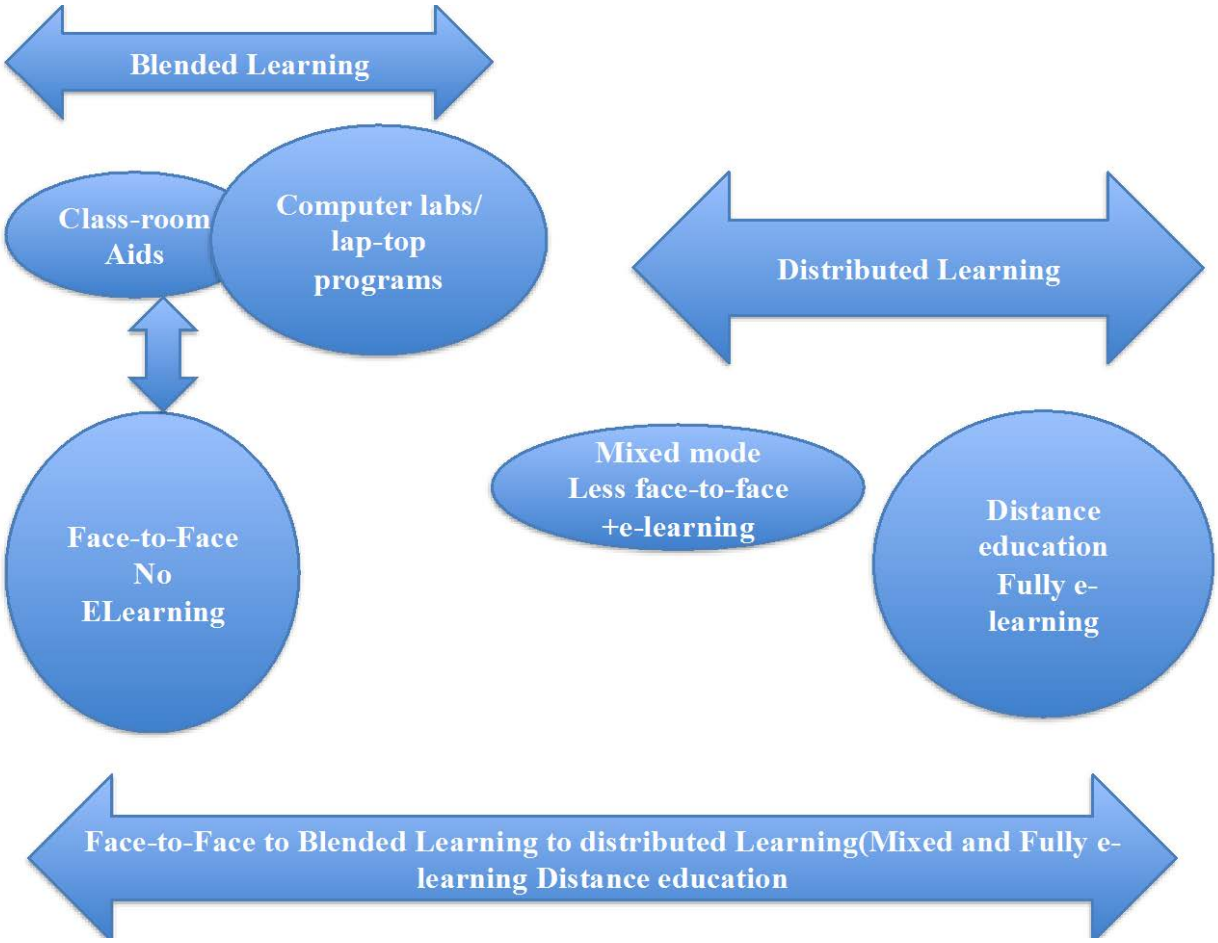


Figure 3.2. Different Forms of E- Learning

Source: Adapted from OECD, (2005) and Bates and Poole (2003)

Globally, universities, including those in Africa, are transitioning or have already moved, from f2f, to blended education, and now to fully online learning offering the same courses and programs through a web-based system. Universities are competing in the market for students and or workers who are interested in advancing their careers, the space (internet connections, network, bandwidth), types of technologies to use, classrooms, academic teachers, and administrative staff. On this basis, Bates, (2011) commented:

> The last development predicted during 2011 will be moves in some states and provinces toward shared software services between institutions. The rapid development of new technologies, the high cost of upgrading mission-critical software such as financial, student information and learning management systems, and the high risk of changing from one supplier to another puts a particularly heavy burden on small to medium sized institutions (p. 17).

The increase in universities offering the same courses and/or programs from f2f to online has challenges, such as the type of academic teachers, types of students/distance learners, workload, incentives, time management, types of technology, organizational support, accessibility, availability, infrastructure, technology policies, role changes, structure, and context. For example, De Gagne and Walter (2009) based on their paper on online teaching experience, a qualitative metasynthesis (QMS), similar to Macy's (2007) study on the transitional experiences by faculty nurses from face-to-face to online, identified issues affecting the transition process such as professional development and faculty support, role changes, teaching strategies and differences in course deliveries, work intensity, time management, and faculty emotions (see Figure 3.3).

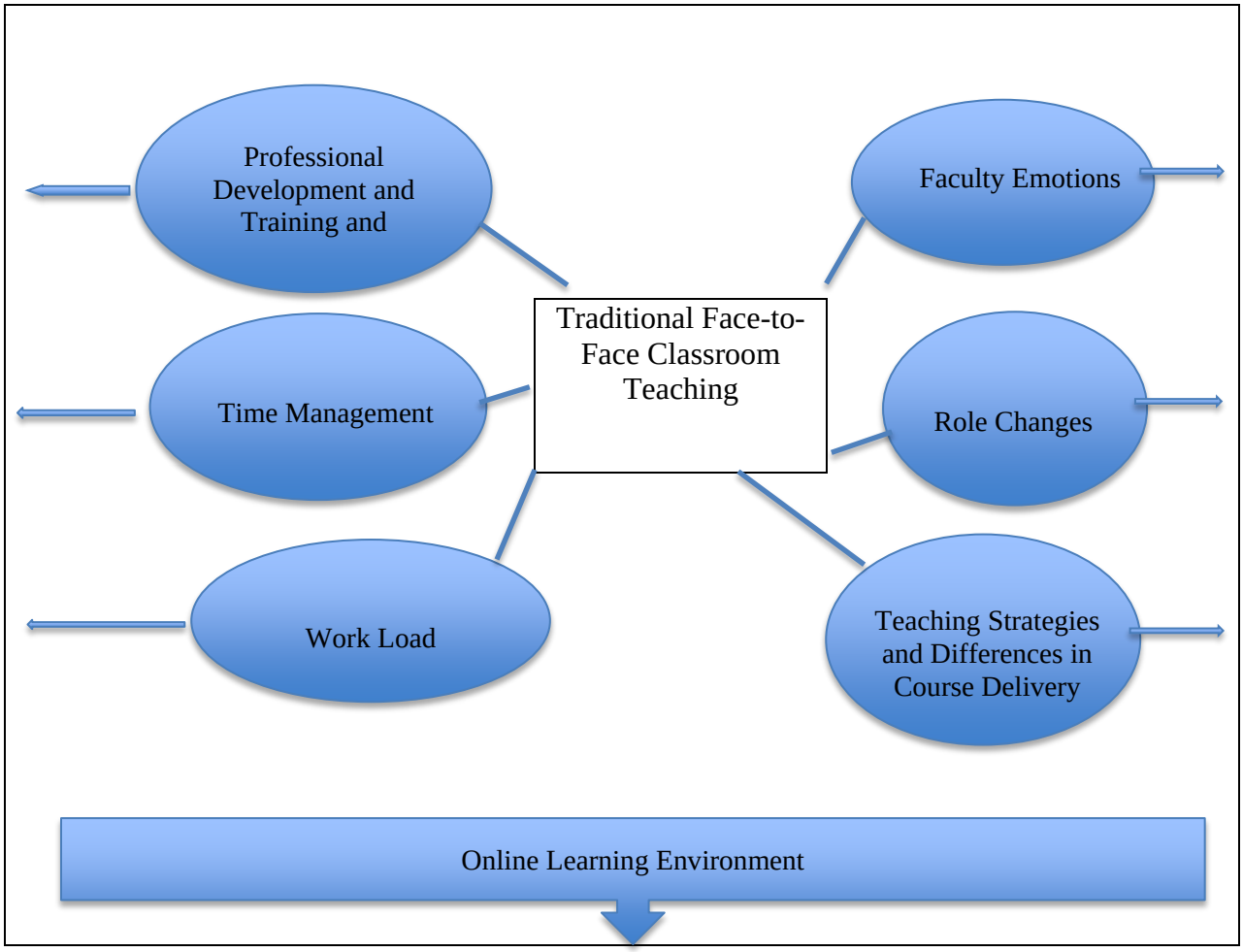
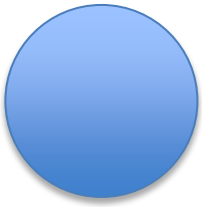
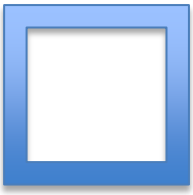


Figure 3.3. Factors that Influence the Transition Process
Source: De Gagne & Walters (2009); Macy, (2007). Illustrates how online educators perceive online teaching through their personal experiences from traditional f2f classroom to online learning



Overarching Categories – Emerging Themes



Transition Area (Open Space) – Process

Online Teaching and Learning Environment

The following section discusses the transition to online learning in a number of studies and highlights some of the key issues. Higher education systems are shifting, and changing from f2f to distance education to online learning, offering courses and programs to all in need using eLearning technologies. More specifically in the African context, lecturers in universities, although supported by the university system through training and professional development, are generally reluctant to adopt and diffuse technology innovations for teaching and learning as compared to academic teachers in the context of the United Kingdom, North America, and Australia.

The focus in the next section is, firstly, to discuss the transition process generally; secondly, to describe transition in the context of the United Kingdom, North America, and Australia; and thirdly, to describe transition in Africa specifically the University of Botswana; followed by the conclusion of the chapter.

3.5.2 Transition Process

Many phrases have been used in relation to the transition process, such as paradigm shift, transformation or change, educational institutions shifted to new modes of learning, education developed through stages, move from to, convert to, new learning process, and education grown through. Yet, they all refer to the same meaning based on the development or history of distance education and reference the word “transition” (Bates, 2008; Harasim, 2000; Johnson, 2008). As is shown in Figure 3.1 there are different forms of eLearning: f2f without eLearning, blended learning with more f2f contact and

classroom aids, computer labs and laptop programs, distributed learning inclusive of a mixed mode with less f2f and more eLearning, and distance education with full eLearning. In addition, lecturers with experiences in f2f teaching, transition from traditional f2f teaching to online environment through a process of role change, professional development and support (De Gagne & Walters 2009; Marcy, 2007; see Figure 3.3). The researchers in distance education such as, Bates, (2000a, 2007, 2008); Garrison, (2000); Keegan, (2000); Moore, (2007); Moore, and Kearsley, (2012), defined transition not in isolation but in the context of distance education because f2f teaching and learning in education transformed, and was used in distance education with print-based materials by then, which was later facilitated with the use of technology in teaching and learning. The transition of education transformation in Africa therefore, is compared to the British, North American, and Australian education systems.

3.5.3 Technology Transition in United Kingdom, North America, and Australia

Britain, the United States, Canada, and Australia moved through different stages in the transition process of their educational reformation. The United States shifted, and changed from f2f to distance education in the 1950s when technology such as TV, radio, and later as the World Wide Web (WWW) were available. Britain followed a similar pattern (Gunawardena & McIsaac, 2004). Whereas, from a Canadian university context, Harasim (2000) argues that there is a shift with online education emerging as a new paradigm. Online education grew through several modes of learning such as f2f to a mixed mode: blended to distance education. This was evidenced in 2003 and 2005 about

the three different forms of eLearning transformed and moved from f2f to blended to distributed learning as noted in Figure 3.2.

The trajectory appears to be development, growth, shift, and change of education from f2f to blended distance education and then to fully online learning (Gunawardena & McIsaac, 2004; Harasim, 2000). Bates (2008) claims that the transformation of distance education was facilitated by new technologies. He mentions five generations and stages of distance education, which is similar to a process of moving from the first level or stage to the next as was reported from the Botswana context by Mutula in 2002, revealing the characteristics of different modes of learning.

The process of changing f2f courses to online learning in a university transforms academic teachers' experiences and processes (Chiasson, Terras, & Smart, 2013, see Figure 3.2). This means that the mode of teaching using technology involves a shift from often a teacher-student f2f classroom that utilizes direct interaction to a more student-based technology-driven, virtual, online or web-based contact. According to Ray (2009) cited in Chiasson, Terras, and Smart (2013) from the University of North Dakota, in the United States context, "for these reasons, a face-to-face (f2f) classroom experience is difficult to replicate in the online environment without adjustment" (p. 313). According to these authors, a synchronous instructional style is comparable to f2f, whereas an asynchronous instructional style does "retain conceptual, pedagogical framework from f2f but had to use different technology tools for presentation of content and for student interaction" (p. 313). The transition process is a means where modes of teaching are

changing from a teacher-centered to a student approach using technology for teaching and learning and this change is where the lecturers find themselves unprepared (Chiasson, et al., 2013). Similarly, Reid (2009) argues from a Canadian university context that when technology is used the delivery mode and classroom structure changes. The changes have impacts on the experiences of adopters' behavior as they familiarize themselves with the new technology.

In summary, the above studies from the United States, Canada, and Australian contexts reveal that these transitions change the system of education in the university. The mode of teaching and learning changes from traditional classroom f2f to fully online, although some universities also use blended distance education, depending on their needs and context. The other point noted from the studies was that the transition changes the adopter behavior, mode of teaching, approach, and strategy in developing materials for blended and online learning (De Gagne & Walters, 2009; Marcy, 2007).

3.5.4 Technology Transition in Africa

African countries that were colonized by the British had an opportunity for students to advance their careers through programs by correspondence through the mail with print-based materials offered by foreign universities such as London, Cambridge, and Oxford (Adekanmbi, 2007). According to Adekanmbi, local privately owned and government assisted institutions emerged after independence. As a result a number of African countries became involved in distance education as a way of promoting

education. The University of South Africa is the largest distance education university in Sub-Saharan Africa that still uses print-based materials for distance education. In more developed countries, universities have moved away from print based programs choosing instead online or blended modes. Distance education in Africa still, by and large, uses print based materials (Dodds, Nonyongo, & Glennie, 2002; Haughey, Murphy, & Muirhead, 2008; Mpofu, 2005; Perraton, 2007).

The University of South Africa was first founded in 1873 (Dodds, Nonyongo, & Glennie, 2002); it was the largest distance education provider in Africa and in the world. According to Boucher (1973), Oxford and Cambridge Universities used the University of South Africa as an examining agency. It is well known globally for its distance education, and offered a range of programs from a certificate to doctoral studies between 1946 and 1959 through correspondence, which was predominantly print-based at that time. Other universities emerged from it such as Technikon and Vista University. The University of South Africa embraced technologies such as radio, video, and audiocassettes to breach the distance between the university and students in the 1970s (Boucher, 1973). It has seven regional centers in South Africa, serving students in all nine provinces locally and others from international states. The University of South Africa offers its programs in both modes, although it started as a predominantly distance print-based mode and currently is increasing its use of technology for global markets. The University of South Africa has gradually transitioning to a combination of print distance education with a residential f2f component, to an online model. The University of South Africa also assisted the University of Botswana, Department of Distance

Education Unit by allowing them to use their materials while they were in the process of developing their own.

Botswana became involved in offering programs through correspondence (mail) and courses that were predominantly print-based from 1960 to 1965 (Nhundu & Kamau, 2002; Tau, 1997, 2008). It was in 1966, when Botswana gained independence that they began to use more technological resources in their correspondence courses, such as radio and television. According to Jones (1979), as cited in Tau (1997) 700 teachers were trained through the correspondence programs to cater to the demand for teachers due to the increasing student to teacher ratio. The system of education in Botswana after independence in 1966 went through changes and moved to other modes of teaching and learning, such as f2f teaching with an intention of ultimately using online learning technologies. This was the time when Botswana developed the Department of Non-Formal Education, which was later moved to the current Botswana College of Distance and Open Learning. The other section for adult learning was moved in 1982 to the University of Botswana, now called the Department of Adult Education at the Faculty of Education. The Department of Adult Education was in collaboration and coordination with the Department of Distance Education in the Center for Continuing Education offering f2f programs and courses through distance mainly blended with the f2f and print-based mode.

Studies on higher education in Africa revealed that universities were faced with challenges such as the high cost of computers, a lack of infrastructure, and the need for

workers with more knowledge, thus emphasizing the need for them to be very focused and strategic in their use of e-learning (Bates, 2007). In order for universities to move to electronic learning, proper strategies need to be put in place, particularly work around infrastructure and capacity building problems. For example, in a study conducted by van Zyl, Els, and Blignaut (2013) in North West University, South Africa, it was recommended that,

> North West University (NWU) should increasingly implement, integrate, and make use of mobile learning, while continuing with already established f2f contact classes, using both print-based study material and various information and communication technology (ICT) to deliver quality open and distance learning (ODL) programs (p. 102).

Similarly, recommendations were made for a study conducted in Botswana by Ntloedibe-Kuswani (2013) that "electronic mobile technologies may be an equaling agent in the future, however the first step is to equal the access and design instructional materials that benefit the flexible needs of a rural community" (p. 175). As a multiple context, mobile learning was recommended in North West University through which the university and academic teachers with students use personal electronic devices for social and content interactions. In another study conducted by Tshabalala, Ndeya, and Van der Merwe (2014) in a developing university in South Africa, it was found that the lecturers were not utilizing the blended learning introduced to them when the university acquired a Learning Management System such as Moodle. These studies were similar to Masalela's (2011) findings of academic staff not utilizing the e-learning technology for the effective transition from classroom to online learning. Generally, the universities fail to include

the academic teaching staff in the initial stages of implementing technology innovation in teaching and learning, and academic teachers were not aware of the ICT policies made. Many feared using technologies for various reasons such as a lack of skills and knowledge, a lack of time, students not using technology, and a lack of infrastructure.

Briefly, the transition is a process over time, historically and contextually developed and diffused. Many universities in Africa intended to transition from f2f to online, following in the footsteps of the United Kingdom, North America, and Australia, however, many have found the transition process to be anything but smooth.

Generally, researchers identified issues affecting the transition process from f2f to distance education to online learning such as the process of change that the individual lecturers were going through, difficulties in coping with the fast pace at which technology changes, poor experiences, rapid role change, lack of time management, insufficient professional development, lack of support, and increased workload (Chiasson, Terras, & Smart, 2013; Masalela, 2011; Mpofu, 2005; Redmond, 2011; Thomas, 2008). On this basis, universities in Africa, specifically the University of Botswana lecturers face many challenges during these transition periods which impact on their intention to use online learning.

The literature concludes that the transition from f2f to blended distance education and then to fully online learning took time in the United Kingdom, North American, and

Australian universities. In Africa, and Botswana specifically, the transition has not been smooth and, one could argue, is still in the beginning stages.

3.6 Chapter Summary

This chapter describes the status of technology in higher education systems in Africa, and the adoption and diffusion of innovation technology by early adopters. It has revealed the challenges faced by universities and individual adopters using ICT for teaching and learning. The chapter explained that the status of technology in universities of Africa is generally low due to lack of proper communication on ICT policy structures, lack of infrastructure, and lack of accessibility of available technology for lecturers and students in universities. It was noted that having experiences with technology was important insofar as it enabled the lecturers to access the available technology, on the other hand, lack of technology experiences could lead to the decrease rate of adoption and diffusion process.

The other point noted was that African countries are not all the same in the diffusion process, and South Africa, North Africa, Mauritius, Ghana, and Botswana were identified to be more focused on the implementation of technology in their system as compared to other African countries. Although these countries are better developed in terms of technology they are still faced with the issue of a digital divide, where urban areas have better technology infrastructure compared to rural areas. This defeats the aim and objectives of many of the ICT policies initiated by governments in Africa for the

available higher education courses and programs offered to be accessible in all geographical areas; that is, rural and urban areas. Higher education in Africa was dominated by the print-based modes of distance education compared to the United Kingdom, North American, and Australian universities, which has transitioned more fully to online learning. The University of Botswana, which initiated changing the mode of teaching to online learning in 2001 has not been so successful. Although, research in Botswana and at the University of Botswana, has shown across the board problems with the implementation of online learning, little in-depth research has been conducted with early adopters themselves to establish what they are doing with technology. It is this gap that this research intends to fill.

CHAPTER 4 – RESEARCH DESIGN AND METHODOLOGY

4.1 Overview of the Chapter

This section outlines the methodological processes undertaken by the researcher. The purpose of my study was to explore in-depth experiences with technology among the lecturers who are early adopters of technology. I used a research design in the form of a case study to explore in-depth the experiences with technology among early adopters in the transition from classroom to distance education. Researchers have observed that case study research allows the in-depth study of an issue over specified periods of time (Creswell, 2012; Merriam, 2014; Savin-Baden & Major, 2013; Stake, 2005; Yin, 2011). Case studies therefore, are about context-dependent knowledge and the experiences of the selected participants with expertise in the area of the study specific to the context (Merriam, 2009; Yin, 2014). In addition, Merriam (2001) states that a case study is an ideal methodology when an inductive, holistic, in-depth investigation is needed. I used an inductive approach to address the experiences of early adopters at the University of Botswana.

In my study I believe that early adopters have experiences in teaching and in technology use that, when explored, could contribute valuable information relating to my research questions. The participants were able to provide me with in-depth information and their point of view through open-ended questions. According to Merriam (1998) “meaning is embedded in people’s experiences” (p. 19). Lincoln and Guba (1985) argue

that, "realities are wholes that cannot be understood in isolation from their context" (p. 39). In this case, my study includes the relevant experiences, values, and context as part of the investigation (Lekoko, 2002). Therefore, a case study facilitates the exploration of a phenomenon such as the experiences of technology among early adopters within its context (Baxter & Jack, 2008). According to Yin (2003), a case study is bound by time and place, time and activity, and context and definition, as is the case in the current study.

4.2 Resarch Design and Methodology

The study uses a qualitative case study approach. The following section describes the rationale for selecting using this approach.

4.2.1 Qualitative Method

Key researchers claim that an interpretative and social constructivist epistemology views the existence of many truths and multiple realities (Merriam, 2015; Yin, 2014; Neuman, 2006). These researchers argue that the reality of multiple truths can be investigated, or explored, or described in-depth from the actual voices of representatives who have knowledge or information the researcher wants to know.

A qualitative paradigm is based on the idea that humans engage with their world differently and make sense of it based on their background (Creswell, 2003). Individuals' views differ and they can interpret a situation differently depending on where they stand.

An interpretative/constructivist epistemology suggests that reality is individually and socially constructed and is multifaceted (Sibande, 2011; Creswell, 2009; Robinson, 2002; Neuman, 2006). This means that individuals interpret the world differently. This aligns well with Rogers' DoI theory (2003,). Rogers claims that individuals interact with their environment to make sense of it based on their experiences from a social-cultural perspective. People interact with the world based on their cultural values and norms (Rogers, 2003). A qualitative research approach was deemed relevant for this study.

According to Merriam (2002), through qualitative research "meaning is socially constructed by individuals interacting with the world" (p. 3). In addition, qualitative research provides insight into and in-depth knowledge of human behaviors and reasons for such behaviors (Merriam, 2002; Reid, 2007). It uses small but focused samples to answer the questions of why and how it is related to decision-making, and not just the what, when, and where from the human voices (Merriam, 1998). It enables the participants to provide open answers based on what they know. My study explores how experiences of technology among participants transition from f2f to distance education at the University of Botswana. Experience is a complex concept, and is socially constructed through interactions with others in the system.

According to Creswell (2009) and Merriam (2002), humans engage with their world and make sense of it based on their historical and social perspectives. This qualitative study focused on the interpretative/social constructivist perspective in exploring people's views and perceptions in-depth from a particular context (Sibande,

2011). Qualitative research acknowledges the fact that there are multiple constructions and interpretations of reality that are in flux and change over time (Creswell, 2009; Merriam, 2015). In addition, according to Merriam (1998) "meaning is embedded in people's experiences" (p. 19). Merriam (2002) argues that, through research "meaning is socially constructed by individuals interacting with the world" (p. 13). How participants construct meaning is complex and dependent on their context. The qualitative researcher tries to uncover that meaning.

4.2.2 Qualitative Case Study Approach

A case study is known to be a qualitative method that emphasizes the collection of in-depth information (Merriam, 2009; Savin-Baden & Major, 2013; Stake, 2010). There are many types of case studies, including explanatory, exploratory, descriptive, multiple-case studies, intrinsic, instrumental, and collective. The reason is because each type of qualitative case study has specific questions to answer and leads to a specific type of qualitative approach. In this research, the university is the case study, to equate with Roger's term social system, and individual lecturers were the unit of analysis. Within these boundaries, the intention was to be exploratory.

A qualitative case study is a relevant method to use to conduct research in a specific context (Yaure, 2004). The researcher can interview participants in their natural context and interact with them on their own terms, gaining a deeper understanding of the

context through a qualitative case study method (Creswell, 2009; Merriam, 2002; Stake, 2005).

A case study is an analysis of a single phenomenon or a social unit for an intensive and holistic description as noted above (Creswell, 2012; Merriam, 2009; Stake, 2005; Yin, 2014). Researchers have observed that case study research allows the in-depth study or examination of extensive amounts of information about a few units or cases over specified periods of time (Creswell, 2012; Merriam, 2014; Savin-Baden & Major, 2013; Stake, 1994; Yin, 2014). Therefore, qualitative case studies are about context-dependent knowledge and the experiences of the selected participants, with expertise in the area of study specific to the context (Merriam, 2009; Yin, 2014).

From the definition, a qualitative case study is bounded and provides in-depth meanings in context. This means that the study is restricted within the context of a case study, for instance, the University of Botswana. The researcher must know the scope of the study to be able to know what the focus of the study is (Yin, 2014). The boundaries indicate the depth and breadth of the study to enable the researcher to answer the why and how questions specific to a qualitative case study (Merriam, 2002; Stake, 2005; Yin 2011). The other advantage of a qualitative case study is that, since it is focused on a single phenomenon conducted within a small sample, the researcher is able to collect in-depth data from participants with expertise in the field (Stake, 1995; Yin, 2014). The philosophical underpinnings for a qualitative case study are commonly the views of an interpretative and social constructivist epistemology, claiming that truths are many and

realities are multifaceted (Sibande, 2011). This philosophy can have multiple units of analysis; therefore, it is important for the researcher to clearly identify at an early stage the unit of analysis for the study to be conducted through questioning. As mentioned, the unit of analysis guided by Rogers' theory (2003) is the individual early adopters at the University of Botswana within the social system through which they operate.

In this study, Rogers' DoI theory (2003) claims that the adoption and diffusion of an innovation is a process in a social system from a micro to a macro level, which is influenced by the social cultural phenomenon. A social system as defined by Rogers is the humans, organization, and informal groups interacting in the environment to adopt and diffuse an innovation through the social-cultural influence in decision-making. The purpose of this study is to explore the early adopters' experiences of technology in the transition from classroom f2f to online distance education at the University of Botswana. The study site and participants were purposively selected and conducted at the University of Botswana with lecturers who are engaged in the transition process.

4.3 Sample Selection of the Site and Participants

Purposeful sampling is a strategy in which particular settings, persons, or events are selected deliberately in order to provide information pertinent to the purpose and phenomenon of interest (Creswell, 2012; Merriam, 2009). According to Mertens (1997) "the choice of participants can be chosen from available institutional records for in-depth

interviews because these participants understand, based on their experiences, how they apply specific phenomenon" (p. 261). The participants were selected from the Department of Adult Education at the University of Botswana because they taught f2f with the intention of transitioning to online learning (see Appendix H). Purposeful sampling was suitable for the study because the intention was not to generalize but to come to an understanding in a particular context. I purposively selected the nine participants from the lecturers in the Department of Adult Education out of the total twenty. These lecturers were specifically those involved in f2f and distance education when delivering courses at the University of Botswana (see Appendix H; Table 4.2). The eleven participants were excluded because they were not involved in the transition process of teaching same courses from f2f to distance with an intention to online learning.

The research site is a specific place where the study was conducted. The site gives meaning to the study (Savin-Baden & Major, 2013). A site can be multiple, visual, or single. In this study, the site was the University of Botswana (see Figure 1.1). The University of Botswana has various faculties with departments as listed in Appendix H. Furthermore, there are other university departments and programs such as the Center for Continuing Education, a program for the disabled, a library, the National Institute of Development Research and Documentation, a legal clinic, the Okavango Research Center, and the Counseling Center. Specific to this study, I initially selected two faculties, Education and Business, with their specific programs and departments as noted in Appendix H. For example, Adult Education and four Business programs were selected because they offered courses through both the f2f to distance education mode using print

and online media. I later excluded the Business programs because of possible conflict of interest issues (see Appendix H). Although two of the faculties and departments deliver programs through f2f and distance, I purposively selected the Faculty of Education's Department of Adult Education.

Sample size, refers to the number of resources used and purposively selected participants in the study. It was important for the study to be focused and specific within a scope. On this fact, the number of resources used and chosen participants determines the depth and generalizability of the study (Creswell, 2012; Merriam, 2009). Qualitative research sample size is generally small and enables researchers to collect in-depth data, while the quantitative research sample size is large to generalize the sampled size from a population as representative of the total population (Creswell, 2012; Merriam, 2009; Stake, 2005; Yin, 2014). Researchers argue that qualitative studies are flexible and allow a researcher to add participants as the need arises, as in my case study, to strengthen the trustworthiness and triangulation of data (Bogdan, & Biklen, 2012; Creswell, 2009; Merriam, 2009; Yin, 2014).

I contacted the Director of the Centre for Continuing Education and Head of the Department of Distance Education Unit and explained why I had selected their department and gave them the consent forms and participants' introduction letters (see Appendix D and E). They then allowed me to contact the coordinator of the Department of Adult Education in the Department of Distance Education Unit, Center for Continuing Education and the coordinator provided me with the list of contact information for all the

lecturers teaching courses through f2f, to the distance education mode. For example, the number of sample participants for my study was originally planned as five but it later became nine because as noted in Appendix H more lecturers had become involved in the transition from f2f to distance education, with the intention of moving online. This was due to the fact that online distance education was a new phenomenon at the University of Botswana.

Qualitative case studies typically work with a small sample size of people (Creswell, 2012; Maxwell, 2012; Merriam, 2002; Stake, 2005; Yin, 2014). I was not concerned about the number of participants but instead was focused on the amount of relevant information I could gather. I thoroughly checked the list of twenty lecturers who taught courses in the Department of Adult Education. Out of the twenty lecturers, eleven taught f2f and others through the distance mode only. Of the eleven, the nine lecturers were delivering the Department of Adult Education courses through f2f and distance education mode (see Table 4.3). The Department of Adult Education coordinator's secretary gave me all the contacts: the emails, office numbers, timetables (class schedules), and telephone numbers of these lecturers. Out of the total twenty participants only eleven were selected. The final list was ten participants (although one participant, after consultations, was not relevant and had to be left out as noted in Table 4.3). From the twenty only nine participants taught conventional f2f to distance education in the Faculty of Education, Department of Adult Education (see Table 4.3).

I emailed all the lectures to make appointments to meet them in person. I was able to introduce myself in the first meeting and briefly inform them about my study and its purpose. I gave them the participant letter and consent form to read (see Appendix D and E) so that when we met for the actual f2f individual interviews, if they agreed, they could sign the forms and return them to me before the interview began. The participants agreed on a suitable day and time for the interviews (see Tables 4.2 & 4.3). I also advised them to contact me for any questions before or on the day of the interview.

Although I managed to interview some lecturers as per the agreed scheduled times, some changed the times due to other unforeseen circumstances such as workloads, conducting workshops, attending workshops, meetings, and power failures (see Tables 4.2 and 4.3). Some classes had to be cancelled on short notice due to electricity issues, and power sometimes cut out in the middle of classes for a day or so. Although all the participants taught f2f to distance education, they did not all teach the same courses in these modes. For example, one participant taught in the Department of Adult Education (XYZ) 706 f2f and (XYZ) 707 by distance.

I also went to the secretary of the Department of Adult Education and managed to get the f2f classroom timetable and the coordinator at the Department of Distance Education Unit, Centre for Continuing Education promised to send me the online distance education sessional timetables to be held on the first week of March 2014. During my meeting with the lecturers for setting the interview dates, we agreed that the specific courses taught through these modes should be identified first. Once courses were

identified, the timetable for observations was suggested to them; this enabled me to plan interviews before the classroom/sessional observations started (see Table 4.3).

The purposeful sampling procedure I used above was in line with the research literature. I selected participants who were suitable for this study (Patton, 2005). Patton (2002) argues that the researcher must select participants one can learn more from, like those with rich information, as in my case study. I applied a criterion and convenient strategies by purposively selecting the participants (Lekoko, 2002). The criterion I applied as noted above was selecting only participants who teach f2f to distance education.

In sum, I purposively selected the site, the University of Botswana, and focused on the Department of Adult Education, who were offering classroom f2f to distance education programs. I also identified and selected nine participants with a specific number of courses taught per participants. Thereafter, I scheduled an interview and observation times with them (see Tables 4.2 & 4.3). The goal was to purposefully select a site, and participants with courses, scheduling times for interviews and observations. Thereafter, I proceeded to collect data at the University of Botswana, Faculty of Education, in the Department of Adult Education (see Tables 4.2 & 4.3).

4.4 Data Collection Methods and Procedures

In this section, the discussion focuses on the specific methods and procedures used for collecting the data for this study. Scholars of case study research emphasize that the methods used to collect data must be based on the specific research design (Creswell, 2009; Lincoln & Guba, 1985; Merriam, 1998; Stake, 1995; Yin, 2014). The methods used for data collection are based on the purpose, discipline, and approach of the study. From a qualitative case studies approach generally data is collected from a variety of sources such as interviews, artifacts/secondary documents, and observations.

It was with this understanding that I used four qualitative case study data collection methods to collect data: artifacts, secondary documents, interviews, and observations. Data collection was divided into two phases (see Figure 4.1). The purpose of Phase 1 was to facilitate my interview guide and observation tools. In Phase 1, I collected artifacts from the participants; that is, teaching and learning materials, and secondary documents such as policies, reports, statistical records, from the University of Botswana, Ministry of Education, Human Resource Development Council previously called Tertiary Education Council, and Southern African Development Community. I read the documents and extracted relevant information to modify the interview guide (see Appendix F). Phase 1 set the stage for Phase 2 where I conducted face-to-face in-depth individual interviews with selected lecturers. I was able to modify, in Phase 2, my interview guide questions, and I developed the observation tools (see Appendix F and G).

In the following sections I describe how I collected the data: artifacts, secondary documents, interviews, and observations (see Figure 4.1).

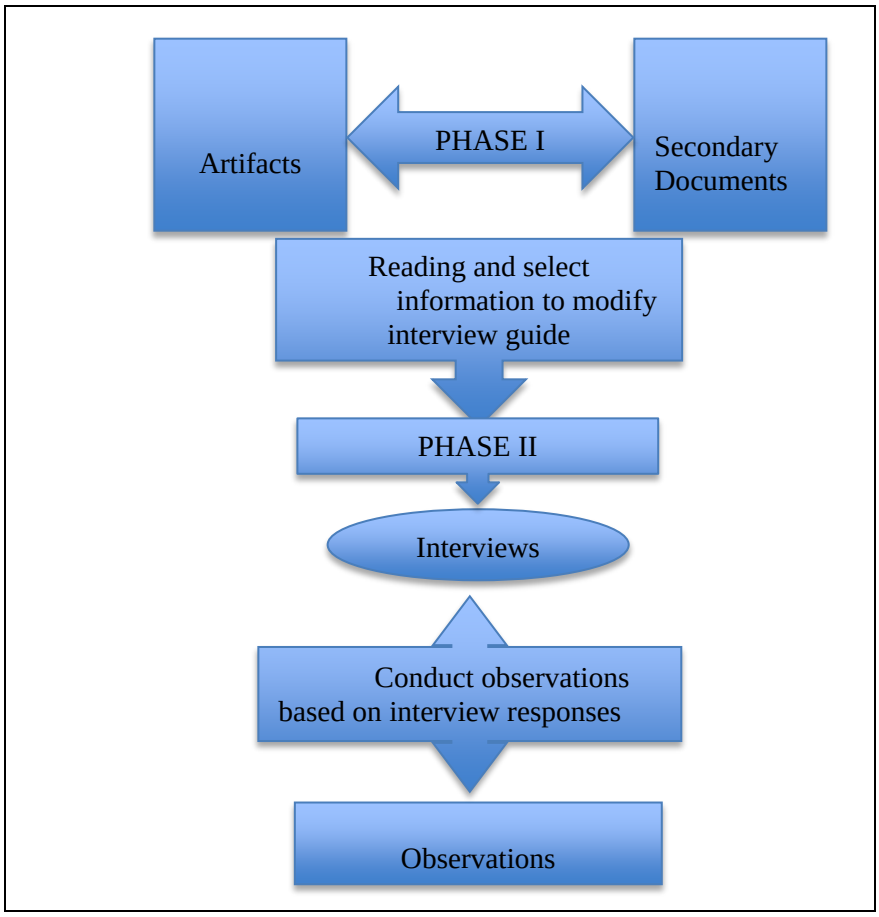


Figure 4.1. Qualitative Data Collection Methods

4.4.1 Phase One

Phase one included artifacts and secondary documents. According to Bogdan and Biklen (1992), documents could be recordings or physical objects that describe subjective experiences, actions, feelings, and beliefs of individuals. Documents are an "unobtrusive form of data and non-interactive" (Musengi, 2014, p. 99), usually, pre-written as past records that are typically used in qualitative methods to augment interviews. I collected artifacts - teaching and learning materials from lecturers, as evidence of what and how they had been teaching, and secondary documents, such as policies relating to how they informed or impacted the transition process in Botswana's higher education system. These two types of documents enabled me to understand the experiences of lecturers using technology at the University of Botswana and also to triangulate the data with interview transcripts and observations.

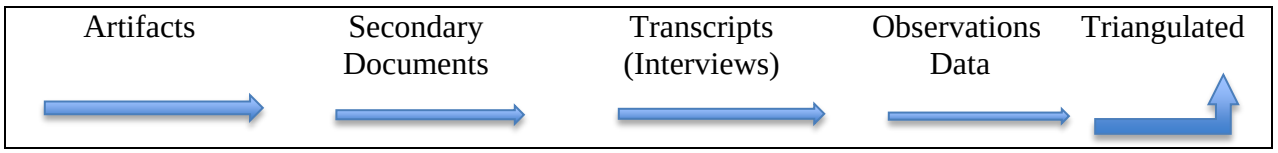
4.4.1.1. Artifacts

Artifacts refer to all types of study materials used in delivering f2f to online distance learning in higher education systems. From a qualitative case study approach, artifacts are important as additional sources of information that can support or corroborate interview data. At the University of Botswana, the artifacts were arranged in three categories: eLearning technology used, distance education materials, and f2f materials. The eLearning technology category included tracking online media and other technologies: personal computers, cellphones, PowerPoint, and software with

telecommunications media: telephones. Distance education materials included modules and study guides. The f2f classroom materials included course outlines, handouts, textbooks (prescribed), lectures notes, and tests and examinations. These artifacts were compared with the interview results and literature review for validation and trustworthiness; see Table 4.1 as an example. The data collected from the artifacts enabled me to understand the activities, interactions, skills, and challenges, in terms of their forms of eLearning used by lecturers.

Table 4.1

A Sample showing the Process of How Data is Triangulated



4.4.1.2 Secondary Documents

According to Savin-Baden and Major (2013), "secondary documents provide rich and readily available sources to the researcher to understand the participants' perspectives and context" (p. 403). The secondary documents specific to the study are the policies, national plans, reports, and records of the University of Botswana, Department of Distance Education Unit, Ministry of Education, government departments relevant to education, Central Statistics Office, Human Resources Development Council which used to be called the Tertiary Education Council, Southern African Development Committee and others beyond Botswana.

In reviewing secondary documents, I was guided by the research questions, and the literature review. I read the documents and prepared notes to compare them later with other data collected in the data analysis section, namely interviews, observations, and artifacts. In addition, I accessed the Memorial University of Newfoundland and University of Botswana websites, library, ProQuest, ERIC databases, and searched on Google for more secondary documents. According to Patton (2002), the combination and or comparing of interviews, and observations with documents (artifacts and secondary) assists with the triangulation process (see Table 4.1). The notes prepared from artifacts and secondary documents enabled me to further develop and modify my interview guide instrument (see Appendix F) and was used also to develop the observation tool (see Appendix G).

4.4.2 Phase Two

Phase two consisted of interviews and observations. Phase one was a road map for these two methods, and was used to modify the interview guide and observation tool based on the information from the artifacts and secondary documents.

4.4.2.1 Interview Process

According to Savin-Baden and Major (2013) “Interviews are the most common method of gathering data for qualitative research” (p. 357), which is similar to Creswell’s (2009) views. Interviews are defined as a specialized pattern of interaction, for a specific

purpose, and focus on specific content (Creswell, 2009; Merriam, 2002; Stake, 2005; Yin, 2014). Qualitative interviewing is a process through which rich, holistic, in-depth data is collected. The qualitative case-study researcher can choose to conduct the interviews on a one-to-one basis or through a focus group (Merriam, 2009; Stake, 2005; Yin, 2014). I chose individual interviews to access this in-depth nature of the data. In my study the individual interviews were tape-recorded, with each session lasting 40 to 60 minutes, and were rich, holistic, and in-depth. Qualitative case study interviewing is in line with the interpretative and social constructivist perspective (Sibande, 2011), which is in-line with my overall research design.

There are different types of interviews that researcher can choose from: structured, semi-structured, unstructured, and informal (Creswell, 2009, 2012; Merriam, 2002; Stake, 2005; Yin, 2003). Using a semi-structured type in this study allowed participants to freely express themselves in a natural setting. Semi-structured questions tend to be open-ended to obtain in-depth information and allowing participants to express their perspectives freely (Merriam, 2009). Some questions are set in advance and can be modified in the process of interviewing based on the responses from interviewees (Creswell, 2012; Merriam, 1998).

I started the interviews by introducing myself to the participants as a researcher and stating the purpose of my study. I requested them to also introduce themselves to me. I informed them about their protection, and issues of privacy and confidentiality. I thereafter distributed the consent form and participant letter to them although they had

already received copies (see Appendix D and E). I went through these two documents with them and asked them to indicate by signing on the consent form their willingness to participate in the study. Finally, I introduced them to the interview guide questions, explaining to them that the questions are only used to guide the interview process (see Appendix F). I requested their permission to audio-record the interviews for accuracy (Patton, 2002). During the interviews, I felt that I was reaching saturation after the fourth and fifth interviews because more new data was not forth coming as repetition had begun to occur (Lekoko, 2002). Merriam (1998) indicated that the acceptable number of individuals to interview for a case study is equivocal and should be based on when the point of "saturation or redundancy is reached" (p. 64). Bodgan and Biklen (2012), and Guba and Lincoln (1994), Merriam (2002), argue that the number of individuals to be interviewed is based on a point of saturation or redundancy. The authors meant that, as the information required becomes repetitive, the sample size is discovered. I decided to continue all my interviews although I had reached the saturation point before all the interviews were completed to use as additional evidence. The participants were willing to give me more information such as written notes they had prepared and papers they wrote. The notes I took during the interview process, and the additional print materials they gave me were used to validate the data in the analysis phase. It was with this understanding that the questions did not follow a fixed order and changed during the interview process based on participants' responses.

While there are advantages, semi-structured questions also have disadvantages. The interviews are conversational and f2f, allowing free, open talk; this is why it is

important for the researcher to prepare interview-guiding questions in advance. However, the greatest difficulty was that it required training to avoid poor listening, leading questions, and repeating questions. It was important to be observant during f2f interviews in order to collect relevant data and I also found it helpful to take notes in this process (Lincoln & Guba, 1985).

Table 4.2

Interviews – Face-To-Face

Tutors	**Time**	**Date**
Kutlo	10 AM	Tuesday 18 February 2014
Itumeleng	5 PM	Tuesday 18 February 2014
Mpho	10 AM	Thursday 20 February 2014
Keitumetse	11 AM	Friday 21 February 2014
Oratile	9:30AM	Monday 24 February 2014
Lesego	11:30 AM	Tuesday 25 February 2014
Serero	3PM	Tuesday 25 February 2014
Mmapula	2:30PM	Thursday 27 February 2014
Lorato	10:30AM	Tuesday 4 March 2014

4.4.2.2 Observations

According to Marshall and Rossman (2014) "observation entails the systematic noting and recording of events, behaviors, and artifacts (objects) in the social setting

chosen for study" (p. 98). Based on this definition, an observation is an ongoing dynamic process in nature because it enables the researcher to understand how the participants react when involved in their real work. I wanted to see a bigger picture by observing participants in the f2f classroom. Using information from interview process, I selected what to observe. These two different methods enabled me to explore their experiences of technology in the transition process.

I was interested in finding out if what I observed matched the lecturers' responses during the interviews. This enabled me to get answers on how they taught with technology and how they were influenced by their experiences in the transition process. I was able to strengthen my study, and also examine non-verbal expressions. The other questions that elicited answers from the observations were: who they interacted with, how they interacted, why, and how much time they spent on various activities? In the interview these answers were given through self-reporting, but my in-class observations allowed me to verify the self-reports (Savin-Baden & Major, 2013).

Observation enables the researcher to understand how individuals socially construct realities (Merriam, 2002; Sibande, 2011; Stake, 2005; Yin, 2014). In a qualitative case study, the researcher can use pre-written questions to guide the observation process as I did in my case study (see Appendix G). Observation enabled me to see aspects of the surrounding environment such as people, events, materials, and documents. The physical reactions by the participants were also observed. Observations were made in f2f classroom and I took notes on the actual teaching. For example, I

observed the early adopters at the University of Botswana delivering f2f and distance education courses during residential sessions (see Tables 4.2 & 4.3).

There are different types of observations such as exhaustive, which means there is no specific focus but a critique of this is that observation becomes irrelevant (Savin-Baden & Major, 2013). Focused observations are very specific but again, here, it is easy to miss out on something if the researcher is not sure of what he or she wants to do or is selectively focusing on various types of activities. In my case I used the latter unstructured observations. I developed a pre-determined observation tool after the completion of the Phase one and Phase two interviews (Savin-Baden & Major, 2013; see Appendix G). My observations both for the classroom f2f and distance education residential sessions were based on the length of the session; for example, the lecturers' sessions varied between one, two, and three-hour sessions. I observed one class per participant. In all, I tried to be as unobtrusive as possible to avoid biasing the observation (Lekoko, 2002). I sat in class as a spectator and did not interact directly, although the lecturer introduced me. This minimized any interference in the class during the observation process and the participation of both the lecturer and students.

The disadvantages of observations are that it can be time consuming and resource intensive. The observer can be biased and record what they think of and know in advance, and, at times, their presence changes the behavior of the participants. The participants could also behave in such a manner that would impress the researcher. It is

thus important for the observer to collect other sources of data so that the observation data can be validated and triangulated.

I observed courses taught through f2f and distance education in residential sessions, although the courses were different for some participants due to the Department of Adult Education and Department of Distance Education Unit in the Centre for Continuing Education planning and organizational issues (see Appendix H). These issues will be discussed when analyzing each case study in the analysis chapter.

I developed and printed the observation tool as noted in Appendix G for each participant in order to focus my purpose on five items: activities, intervention, organization, advantages, and disadvantages, which were developed based on the artifacts, secondary documents, and individual semi-structured interviews (see Figure 4.1). In the process of observations, in a written form, I developed some classroom diagrams based on what I saw in the class (classroom structures). I developed notes for each participant from the observation tool to compare later with the other data (see Table 4.1). The observation times, although scheduled in advance with the lecturers, sometimes had to be changed at times due to uncontrollable circumstances. For example, the three participants in **bold** as reported in Table 4.3, were not observed because the students missed the classroom venue and, similarly, the lecturers missed the times and venues. This was an issue because both parties did not receive the timetable on time, due to an administrative planning issue.

In summary, a combination of semi-structured interview instruments, the examination of artifacts, review of secondary documents, and observation notes were used in the qualitative research for triangulation, shown in Table 4.1 as an example. The combination of using three or four techniques for gathering and analyzing the data was for cross-data validity checks (Yin, 2014). Triangulation, as one of the cross-data validity checks, promotes the verification and validation of qualitative data and also the validation of sources, ensuring the consistency of data from different sources (Creswell, 2009; Merriam, 2002; Patton, 2002). The interviews as instruments were compared with official documents such as secondary documents and artifacts for further validation as shown in Table 4.1.

Table 4.3:

Observations – Classroom and Residential Sessions for Distance Education Teachings

Tutors	**Time**	**Date – Observation: Classroom**	**Date – Observation: DE**
Kutlo	11AM	Thursday 27 Feb. 2014	11 and 13th March 11 and 11AM (Tuesday & Thursday)
Itumeleng	10AM	Wednesday 26 Feb. 2014	**Thu -13 March – 2PM**
Serero	N/A	N/A	Thu – 13 March – 8AM
Mpho	6PM	Tuesday 25 Feb. 2014	Tuesday 11 March – 16:30PM
Mmapula	8AM	Thursday 27 Feb. 2014	Tuesday – 11 March – 2PM
Lesego	8AM	Friday 28 Feb. 2014	Wed 12 March – 8AM
Oratile	5pm	Thursday 6 March 2014	**Wed – 12 March – 11AM**
Keitumetse	1300	Thursday 6 March 2014	Tuesday – 11 March – 8AM
Lorato	1300	Tuesday 4 March 2014	**Wed 12 March – 11AM**

Note: The three participants in '**bold'** were not observed because of missed venues and times for f2f teaching.

4.5 Recording of Data

Since my study was a qualitative case study, I preferred to take notes from the artifacts and secondary documents, which I collected. I also audio recorded the participants' voices during the interviews, and took notes during the observation process. According to Patton (1990) tape recording is important, whereas Lincoln and Guba (1985) argue that tape recording should not be recommended, and should only be used for unusual reasons, with note taking been preferable. Their main reason was because technical recording devices can fail and/or interfere with other networks (Lekoko, 2002). I tape-recorded all interviews and I was taking notes continuously before, during, and after data collection to ensure I captured all the data.

The interview transcripts were transcribed into text (Creswell, 2012; Merriam, 2002; Patton, 2002). I transcribed data verbatim. Once the process of transcribing was completed, the next step was to organize the typed information (see Appendix I).

4.6 Data Analysis

This section provides an overview for the rationale of using the constant comparative method, the data analysis process and reflections, the coding of the data, the preliminary and advanced stages of data collection. Data analysis, according to Bogdan and Biklen (1992), as cited in Lekoko (2002) is "working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering

what is important and what is to be learned" (p. 145). The data analysis for my study focused on exploring how the experiences of technology of each individual University of Botswana academic teaching staff member influences or is influenced by the transition from classroom to distance education using media that is print and online. The experiences and transition processes were both qualitative in nature; therefore, I took an interpretative stance for rich description and insights (Lekoko, 2002).

I analyzed my data before, during, and after collecting data. Bogdan and Biklen (2012) argue that data analysis begins when the researcher explores the literature before and during data collection. The process of continuously analyzing the data enabled me to formulate a deeper understanding of the phenomenon of how experiences with technology influenced the transition process (Bogdan & Beklin, 1992; Creswell, 2012; Merriam, 2002; Yin, 2014). The simultaneous process of collecting and analyzing data is a qualitative approach as noted by Marshall and Rossman (2014) and Creswell (2009). I continuously worked with data before and after collecting, organizing it back and forth, breaking it into manageable parts, synthesizing it, searching for patterns, and discovering important things to be learned to inform my study (Bogdan & Biklen, 2012; Merriam, 2009; Yin, 2014; see Appendix I and Figure 4.2).

There are different methods of data analysis but due to time and space constraints I will not go into detail about each one of them; rather, I will just list them and only discuss the one relevant to this study. Some data analysis techniques are as follows: content analysis, domain analysis, thematic analysis, heuristic or phenomenological

analysis, hermeneutical analysis, ethnographical analysis, narrative analysis, discourse analysis, semiotic analysis, and the constant comparative method (Savin-Baden & Major, 2013). I chose the constant comparative method for my data analysis (Lekoko, 2002; Ntseane, 1999; Sibande, 2011). A qualitative constant comparative method was the best data analysis method to use to constantly compare the data for trustworthy results (see Figure 4.2). The constant comparative method served the purpose because my data was in the form of text, transcribed verbatim in notes and observations. My main aim was to examine the artifacts, secondary documents, transcribed interviews, and observations, along with the additional notes, memos and materials collected, and to determine the coding, categorizing, and themes that emerged (see Appendix I). It was a major challenge to make sense of the huge amount of data collected, reduce the volume of information, identify patterns and keywords, and construct a framework to communicate the results. This is similar to the views in the literature (Patton 1990).

The process through which I analyzed the transcribed interviews and extracted hundreds of keywords, identifying categories and themes is illustrated in Appendix I. I compared the data back and forth by reading/re-reading the transcribed data and listening/re-listening to the actual interviews to obtain a thick description (see Figure 4.2). According to Denzin (1989), Geertz (1973), and Ponterotto (2006), thick description is a way of writing that includes describing the human voices, feelings, actions, and meanings in context as stated in Figure 4.2.

Figure 4.2. Data Analysis Process

Source: This is based on my study's analysis and on the views of Merriam, 2009; Creswell, 2012; Yin 2014; Bogdan & Biklen, 2012; LeCompte, 2000; Corbin & Strauss, 2008; Marshall & Rossman 2014; Maxwell, 2012; Charmaz, 2000, 2008).

The constant comparative method facilitated the identification of general statements, as stated in Figure 4.2 deduced from the actual verbatim keywords through open coding categorized into common themes (see Appendix I). Fram (2013) stated,

> Incidents or data are compared to other incidents or data during the process of coding. This process begins with open coding to develop categories from the first round of data reduction and further reducing and re-coding allows possible core categories to emerge (p. 3; see Figure 4.2 and Appendix I).

I coded my data by breaking it down into discrete, manageable units as in Appendix I, examined them by continuously comparing them for some similarities and differences, and grouped them under categories (Fram, 2013; Strauss & Corbin, 1998). I used open coding looking for patterns in the data collected. I had to scrutinize each line of the transcript, looking for direct responses. I wrote some notes on relevant data, words, sentences, and paragraphs that captured the meaning (Lekoko, 2002; see Appendix I). I was able to identify categories and sub-categories. The categories at this level were broad. Axial coding was used at this stage to determine the linkages and connections between the categories identified by open coding and constantly comparing them (see Appendix I). I was comparing them in new ways and looking for outliers. I had to constantly compare the categories identified through open and axial coding before writing. Thereafter, selective coding, I named the categories and subcategories based on the sources. I started analyzing one transcript of one participant, Kutlo, and used it as the basis of a framework to analyze the remaining eight participants (see Appendix I).

In retrospect, the data analysis focused on participants' terms, viewpoints, and indirectly answered the research questions. When I was rigorously going back and forth during the data analysis (see Figure 4.2 and Figure 4.3), I observed the following stages from preliminary to advanced analysis.

4.6.1 Preliminary Analysis

Stage 1: I familiarized myself with the data by reading/re-reading transcripts and listening/re-listening to the tapes as in Figure 4.1 (Bogdan & Beklin, 2012, Corbin & Strauss, 2008; Merriam, 2015; Yin 2014). I printed hard copies of the nine transcripts. I read all the transcripts, starting with the first one, identifying questions asked when conducting individual f2f interviews. The reason for this was because although I used guided interview questions to focus my study, the questions were modified based on each individual's response (see Appendix F). I listed questions as per participant and then compared them to select the common questions specific to my study's scope, purpose, and research questions. The process of listening to each individual respondent's questions and answers in line with the interview guide enabled me to capture all the information analyzed. As I was reading, I identified key concepts and wrote them on the edge of the right side of each transcript as initial coding.

4.6.2 An Advanced Analysis

Stage 2: I generated initial coding through open code by categorizing the transcripts verbatim. This is the stage in which I conceptualized my data analysis based

on the research questions and my theoretical framework (Creswell, 2012; LeCompte, 2000; Yin, 2014). The questions shown in Table 4.4 were categorized, grouped on the basis of their similarities, differences, and outstanding responses (see Appendix I). For example, in Table 4.4 below, all secondary questions with their probes for all nine participants were grouped together, as well as all question twos and threes: general questions. I grouped and put together all the answers with similar meanings. I developed themes and sub-themes, grouping all nine participants' questions, for example, 'describe your university teaching and yourself' coded as (DYT) with the answers of all nine participants'. I further analyzed them by identifying questions and answers, answering research questions and labeling outstanding responses as outliers (see Appendix I).

Table 4.4

Sample of Analyzed Research Questions

Interview Transcripts – Verbatim	**Research Questions – What are the characteristics, skills, and beliefs of early technology adopters?**	**Common Themes and sub-Themes**
"…..you stand just beside the blackboard and then just keep on explaining everything that is on the slide when that is complete you move on to the next slide".	Probing – Describe your teaching? Coded as 'DYT'	
" ……you have got to do the work …."	Probing – Describe your teaching? Coded as 'DYT'	
"…..I give them the theory or the concepts then I demonstrate the concepts".	Probing – Describe your teaching? Coded as 'DYT'	
"first of all I use the lecturing method where predominantly I use the power-point to present my notes to the students…"	Probing – Describe your teaching? Coded as 'DYT'	

I then arranged similar questions and answers. I applied the principles of open, axial, and selective coding (Bogdan & Biklen, 1992, 2012; Creswell, 2012; Merriam, 2009; Stake, 2010; Yin, 2003; 2014, see also Appendix I). I observed that coding facilitates the data analysis process of planning, organizing, separating, and grouping the concepts for thick description as in Figure 4.2 above. Thereafter, I started coding the questions. I compared them (artifacts, secondary documents, interview transcripts, and observations) going back and forth until the saturation point was reached for thick descriptions as stated in Figure 4.2.

Stage 3: Thereafter, I grouped the open codes categorized as verbatim back together in a new way as axial coding as in Appendix I, making connections between categories (Corbin & Strauss, 2008).

Stage 4: Through selective coding, I reviewed all the codes identified from stages 1 to 3, finding the core variables (see Appendix I). In this process I looked back at the research questions to find out if they had been addressed and also if Rogers' DoI theory (2003) had been adhered to. It was from this exploration of going back and forth through the data analysis process as shown in Figure 4.2 that themes emerged.

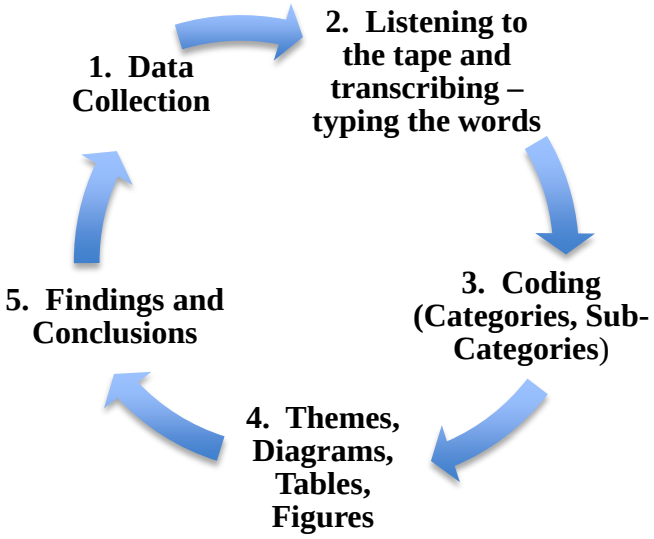


Figure 4.3. Data Analysis Cycle

4.7 Trustworthiness

My main aim of the findings for the study was to benefit the Botswana government departments, the University of Botswana, faculty teaching staff, and faculty departments. As a result, the issue of validity and reliability in qualitative research is important. This section addresses the trustworthiness and believability of the research results.

Merriam (2002) notes that qualitative rigor has three types: internal validity, reliability, and external validity. According to Merriam (2002) and Lincoln and Guba (1985), internal validity is judged on whether or not the findings represent reality and as truth-value representing multiple perspectives. Qualitative researchers view reality as changing and representing multiple perspectives, (Sibande, 2011).

As previously noted, I triangulated and compared the data for its trustworthiness and accuracy (Lekoko, 2002). In addition, I conducted a member check. I distributed the transcripts to the participants for further trustworthiness in terms of dependability, credibility, and originality. In this regard, I ensured that what I captured was tape-recorded and that the notes written were exactly what the participants said. I used the member-check process by giving all nine participants the transcripts and my notes and discussed with them my interpretation of their reality to ensure me that the participants' perspective and experiences were adequately captured (Charmaz, 2000; Lekoko, 2002; Stake, 2010; Yin, 2014). I had to ensure that the data collected from the participants were recorded verbatim, that is, exactly the original information without any changes to it, as reported by them.

Lincoln and Guba (1985) argue that it is the reader who decides whether the results are applicable to their situation. This means the results of a study can be generalized to other situations or people. In sum, I used a combination of four data collection methods: the examination of artifacts, secondary documents, semi-structured interview instruments, and observation notes. The combination of using the four techniques for gathering and analyzing the data was to check for cross-data validity (Yin, 2014). Triangulation, as one of the cross-data validity checks, promoted the verification and validation of qualitative data and also the validation of sources, facilitating the consistency of data from different sources (Creswell, 2009; Merriam, 2002; Patton, 2002). The interviews as instruments were combined with official documents for further validation. Therefore, the reliability of the qualitative study hinged on whether the results

consistently and dependably represented the data (Lincoln & Guba, 1985). I kept detailed notes, memos, and journal records for all my data collection methods for the purpose of keeping an audit trail and for consistency.

4.8 Ethical Considerations

The Memorial University of Newfoundland Interdisciplinary Committee on Ethics in Human Research's (ICEHR) process for this study was completed and approved (see Appendix A and B). In addition to gaining approval from the ICEHR of Memorial University, the researcher applied for a research permit from the University of Botswana Office of Research and Development. The process for this permit was completed and approved (see Appendix C). Ethical issues on data collection were guided by the expectations of these two official documents from Canada and the Republic of Botswana.

The nine selected early adopters at the University of Botswana from the Department of Adult education, Faculty of Education were allowed time to read and sign the informed consent form before the interviews started (see Appendix D and E) as described in previous sections. The researcher made sure the participants understood their safety, confidentiality, the privacy of their information, the flexibility in their ability to stay or withdraw from the research, freedom to ask questions, and permission to audio record their voices (see Appendix D and E).

4.9 Researcher's Stance

As a researcher I had the capability to influence the findings of my study. I am a human being and have my own perceptions that could have impacted the study (Lincoln & Guba, 1985). Qualitative research requires researchers to reveal and discuss any biases or experiences of the study (Lincoln & Guba, 1985). This section focuses on my experiences and perspectives that could have impacted the study and how I decreased my biasness. During my interviews, I used open-ended questions and closely listened to participants' responses to avoid being biased and misinterpreting the data. I was a coordinator of distance education programs for Business Studies in the Department of Distance Education Unit, Center for Continuing Education at the University of Botswana before pursuing this PhD program. According to Charmaz (2000) the researcher's professional background as a scholar within an academic discipline is an important part of the identity of the researcher. I purposively selected the Department of Adult Education as my focus site and not Business Studies because I worked in Business Studies previously. I worked in various departments as a lecturer, and was a coordinator of Business programs by distance mode. Briefly, I can say that biasness was always there but one has to actively strategize to minimize it as I did in this case.

4.10 Limitations

The limitations specific to my study are non-generalizability, and the timing of the data collection, which are discussed below. Firstly, qualitative data is often not

generalizable because it is collected from a small sample for in-depth information (Creswell, 2009; Merriam, 2009). I conducted f2f semi-structured interviews, and the purpose was to obtain in-depth data. Since the nature of the research was to access detailed data, this study is not generalizable (Bogdan & Biklen, 2012). Secondly, I did not conduct observations in three classes, but I managed to interview the lecturers. Thirdly, as the researcher, I conducted interviews personally, therefore, I used four instruments to collect data: artifacts, secondary documents, interviews, and observations to minimize biasness, especially my subjectivity. The four different forms used to collect data as previously noted are described, continuously compared, and peers to check for accuracy and correctness. Fourthly, the other limiting factor was that a small number of lecturers were interviewed. Including students and administrators in the sample would have strengthened the study. The students, administrative staff, and other faculties were not included in the study because the scope of the study would be too large for its purpose. Therefore, further research should be conducted with other University of Botswana faculties including students and administrative staff while still focusing on the transition process.

4.11 Chapter Summary

This chapter described the research design and methodology for this study. A qualitative case study approach was used to specifically focus on one aspect of the phenomenon; that is, the University of Botswana as a case study and the lecturers as a unit of analysis. The data was collected from artifacts, secondary documents, interviews,

and observations. The data analysis was based on the constant comparative method where the data collected was constantly compared to identify codes and themes. The data collected through artifacts, secondary documents, interviews, and observations were constantly compared for accuracy, credibility and trustworthiness as a means of triangulation and member checks. I presented my stance as a researcher to clarify my biases so that the reader is able to understand the lens through which I interpreted my results. The study's limitations were also noted.

CHAPTER 5 – POLICY CONTEXT OF EDUCATION IN BOTSWANA

5.1 Introduction

This chapter focuses on reviewing policy documents in Botswana from a national level and how they affected policy at the University of Botswana. These national documents were instrumental in guiding and developing the entire education system in Botswana. To situate the technology experiences of early adopters at the University of Botswana, it is important to understand the impact of these policies. The policy documents discussed in this chapter are listed in Table 5.1. The section that follows describes the context of national policies on education.

Table 5.1

National Policies - Relevant National Policy Documents

National Policy Documents and Name of Institution	Year	Description and Purpose/Objectives of the Documents/Policies
National Commission on Education – Ministry of Education	1975 – 1977	Formulates the country's education philosophy and *Education for Kagisano;* that is, education for social harmony Main intentions: To facilitate pre-primary access to education from six years To set goals for the development of education and training To recommend the best strategies to achieve these goals

National Policy on Education – Ministry of Education	1977	Provide a sound framework for educational planning and the provision of education and increase access to quality education: Main intentions: To increase access to education at all levels, with special emphasis on universal access at the primary level To develop education for human resources To increase educational expenditures at the primary level
National Commission Policy on Education – Ministry of Education	1992/1993	Quality education for all, particularly human resource manpower aimed at developing the nation
Revised National Policy on Education – Ministry of Education	1994	Universal access to quality primary and secondary education and life-long learning for adults
Botswana Vision 2016	1997	Vision 2016 articulated the need to have "an educational and informed nation". The government committed itself to improving access to preschool education, the provision of ten years of basic education for all, to increase access to senior secondary education, and to expand vocational and technical training and the promotion of lifelong learning. The core drive is to focus the education

		system on mainly providing programs that will lead to higher quality human capacity and productivity, leading to a higher quality of life and prosperity for all (NDP 9, 2003). Vision 2016 states that, "science and technology should be emphasized in education systems" (p. 33).
The Development of Education – National Report of Botswana – Ministry of Education	2001	This report provides information on the development of the education system in Botswana from 1990 to 2000
National Development Plan 9 – Ministry of Finance and Development Plan	2003/2004	Life-long learning and accessibility of education
National MAITLAMO ICT Policy	2005/07	Easy access to information for education
Proposal for a Botswana Tertiary Education Council	2006	Emphasizes the accessibility of tertiary education programs and technology in education
National Development Plan 10 – Ministry of Finance and Development Plan	2007/08	Increase access and equity, improve quality and relevance of education and provide competent human resources
Ministry of Education and Skills Development Tertiary Education Council	2008	Improve access to education for the nation
Tertiary Education Council Policy and Planning	2008	Access to tertiary education and technology
Tertiary Education Council	2009	Higher education

Strategic Plan to 2009		Accessibility to the nation
Human Resource Development Council (HRDC)	2014	Advises on human resource development and tertiary education matters

After independence in 1966, the Botswana government prioritized education by purposively developing a series of commissions and policies aimed at expanding schooling both at the primary and secondary levels as well as training to develop skills for adults (Monyatsi, 2002). A key focus of many of these policies was to train teachers to ensure the provision of quality education. As the first National Commission on Education (1977) noted, "the quality of teaching is the most important influence of the quality of the education provided in schools" (p. 127). The government systematically approached education through focused and consistent policies alongside broader development plans such as the National Development Plans, and Vision 2016 (1997). The main national policies are described below.

The first National Commission on Education was established in 1975 to review the education system in Botswana after independence. This commission report was accepted in 1976 and developed into a policy in 1977 and was subsequently called the National Policy on Education. After independence, the government reviewed the implementation of national policies through commissions. As larger, global changes in education became more common, the commissions incorporated these new ideas into national policies. In 1993, a second commission, the National Commission Policy on

Education, was called to investigate the quality of the country's education system. In 1994, a third review, the Revised National Policy on Education, was conducted. Through these commissions and reviews the education system in Botswana developed further. The following sections describe Botswana's main national policies from 1977 to the present day, which are explored and analyzed to understand the context of this study.

5.2 The First National Commission on Education (1977)

The first National Commission on Education was set up in Botswana as a presidential commission to formulate the country's philosophy of education, to set goals, to establish training, and to suggest recommendations to achieve the goals (Letshabo, 2000). The National Commission on Education's (1977) philosophy emphasized Education for Kagisano, which means Education for Social Harmony. Education for Social Harmony emphasized the four national principles of democracy, development, self-reliance, and unity. The intention of this policy was to guide the education system in Botswana through this underlying philosophy for the next 25 years.

The National Commission on Education's (1977) goal "was to make education available to a much wider section of the population and to break away from the pre-independence education system that was a legacy of Botswana's colonial history that restricted access to quality education to the privileged few" (National Report of Botswana, 2001, p. 2). According to the National Commission on Education (1977), "Batswana were encouraged to believe that their own cultural inheritance was inferior to

that imported by the British" (p. 11). A key goal of the National Commission on Education was to promote widespread access to education.

The National Commission on Education recommended quality entrants to the teaching profession since teachers would affect the overall quality of education. The aim of the National Commission on Education (1977) was to:

> give priority to quantitative and qualitative improvements in primary education; provision of nine years of basic education and a re-orientation of the curriculum to embody the cardinal national principles and to emphasize acquisition of basic knowledge and skills needed for national development (National Report of Botswana, 2001, p. 2).

The expansion to nine years of basic education included seven years of primary education and two years of junior secondary, which was compulsory at the time as a means of fulfilling the declaration of education as a human right for educating all. The aim of expanding basic education was clearly stated in Recommendation 35 (Republic of Botswana 1977), which states that,

> The Commission recommends that over a long term, Botswana should move toward nine years of virtually universal education. The primary cycle should be shortened to six years and should be followed by three years in junior secondary school for all students. Such a system should be feasible by 1990 (p. 89).

The aims and objectives proposed and recommended by the National Commission on Education (1977) were strategically implemented through the National Development Plans. The National Commission on Education's (1977) proposals and recommendations

were achieved to a certain extent in National Development Plan 3 (1973-1978). During this period, teachers were trained to meet the enrolment capacity and to improve the level of education. Improving the quality of education, which was proposed in the National Commission on Education (1977) to be accomplished through training teachers, was also emphasized in the Revised National Policy on Education of 1994 and Vision 2016 of 1997, where it was recommended that teachers should be upgraded to diploma and university degree levels. The Revised National Policy on Education (1994) stated that,

> The entry qualifications into primary teacher training should be raised to a minimum Cambridge Overseas School Certificate of 'O' level and the period of training should be three years. The pilot Diploma program should be extended to all the primary teachers training institutions so that all future primary teachers will be trained for the Diploma in Primary Education qualification (p. 45).

According to Major and Trio (2012), the University of Botswana also offered a bachelor's degree in Primary Education. The University of Botswana's student enrolment from 1982 to 2012 had increased to 15,966 full-time, 2,171 part-time, and 580 distance learning students, with 890 academic teachers, showing the rate at which higher education was accessible (University of Botswana, 2012). Between the years 1980 and 1990, the number of junior and secondary schools also increased due to high student enrolment (Monyatsi, 2002). This is the reason why the University of Botswana's student enrolment increased through to 2012. According to Vision 2016 (1997), school enrolment had risen to about 70% compared to 52% in 1980. In 1970, adult literacy had risen to 41%. National Development Plan 7 (1991) advocated for schools to increase enrolments, train

teachers, and establish primary school leaving examinations, with seven years of free schooling.

In 1997, the National Development Plan 8 policy strategically implemented the National Development Plan 7 (1991) items further, such as by setting up units referring to departments responsible for pre-primary education, training teachers in specific fields and disciplines within the Ministry of Education, and generally increasing access and quality at the primary level (Letshabo, 2000). The number of classrooms was increased and class sizes were reduced from 40 to 30 (Revised National Policy on Education, 1994; Vision 2016, 1997).

The National Policy on Education of 1977 endorsed the National Commission on Education (1977) philosophy of Education for Kagisano, particularly in National Development Plans 5 and 6 (Leshabo, 2000). The National Commission on Education (1977) further proposed a national service scheme for Form Five leavers in secondary high schools and also emphasized part-time learning and out-of-school education. It was in 1980 when this scheme, called Tirelo Sechaba, was introduced by the government "as an exercise in nation-building, designed to encourage self-development of participants, to enable them to participate in rural development, especially in remote areas, and to sensitize them to other social and cultural situations" (Molefe, Mudariki, Tsayang, & Weeks, 1997, p. 69). The national service scheme was also introduced because the increasing number of school leavers could not all be absorbed by the modern economy and ended up being displaced. During the 1977 National Policy on Education period, the

number of schools increased and student enrolment goals both in primary and secondary schools were achieved, which led to the decline of quality education. The student-teacher ratio increased and teachers were not able to meet the needs of all students. There was a shortage of qualified teachers and unqualified teachers were left to teach in schools, leading to the failure of quality education.

The government of Botswana set up a second National Commission on Education in 1992 (Letshabo, 2000; Monyatsi, 2002). This commission emphasized universal access to basic education, vocational education and training, preparation and orientation towards the world of work, articulation between the different levels of the educational system, and re-examination of the education structure (Republic of Botswana 1993). The 1993 National Commission of Policy on Education was adopted into the 1994 Revised National Policy on Education, where the two policies aimed to address the decline of quality education during the National Commission on Education's (1977) achievements. The Revised National Policy on Education (1994) declared that, "the success in quantitative development of the school system has not been adequately matched by qualitative improvements. … quality assurance measures will be a major priority in the overall development of education" (p. 3).

5.3 The Revised National Policy on Education (1994)

The National Commission on Education (1977) and National Policy on Education (1977) took place during a time when most people in Botswana had minimal skills, so

there was a need for the Botswana government to train and professionally develop the nation in preparation for moving from an agriculturally-based economy to an industrial (mining) based economy. At this time Botswana was faced with the challenge of preparing the nation for a global economy (Letshabo, 2000). This commission was to,

> advise on how best to ensure that the system was responsive to the needs and aspirations of the people of Botswana in view of the country's complex and ever changing social and economic situation (National Report on Education, 2001, p. 2).

The Revised National Policy on Education (1994) was conducted to review the entire education system since 1977, with particular emphasis on universal access to basic quality education, and vocational education and training. The Revised National Policy on Education (1994) emphasized science and technology as key subjects in the education system, as well as life-long education for adults. The Revised National Policy on Education made some recommendations such as: a 10-year basic education consisting of seven years of primary and three years of junior secondary; the need to increase the participation of pre-primary (early childhood, less than five years old) education prior to schooling; education for people in remote areas as Remote Area Dwellers (RADS) and for cultural minorities; and for continuing life-long learning and basic education for adults (Letshabo, 2000). In 1997, a long-term vision plan called Vision 2016 was developed in order to achieve the aims of the Revised National Policy on Education (1994). The 1994 Revised National Education Policy did not take care of ICT policies, although the Report of the National Education Policy (1977) emphasized and proposed that technology be taught and used in Botswana's learning institutions.

The Revised National Policy on Education (1994) and Vision 2016 (1997) emphasized the use of technology, especially computers, in schools and by the public at large. Vision 2016, (1997) as indicated in Table 5.1, outlined that, "The world is changing as the revolution in communications technology brings people from every country into the global market, and increasingly intrusive global culture" (p. 28). The policy defines and emphasizes the fact that distance should not be a barrier and that education should reach all individuals wherever they are and whether separated by time or geographical distance. It states that all areas, rural and urban, as shown in Figure 1.1, need to be networked and connected to the internet to allow accessibility to information for the future knowledge society (Republic Botswana Vision 2016, 1997).

The recommendations made in the Revised National Policy on Education (1994) were based on computers being used in schools. It was further emphasized in the Vision 2016 (1997) long-term plan, that the Botswana nation should be an educated, informed society that is able to use computers by 2016, when Botswana will have achieved 50 years of independence. For example, Magetse (1997) reported that the Ministry of Education through the Curriculum Development Division in 1995/96 introduced a Basic Computer Awareness Course for junior secondary schools. A basic Computer Awareness Course was also offered to teacher training colleges so that teachers at the secondary education level would be trained in computer skills. According to Batane (2004) in a study conducted in Botswana, teachers trained in computers skills through in-service were not satisfied with the training. Batane recommended a more systematic approach to training in schools. In the National Development Plan 10 (2008) it was stated that the

introduction of subjects such as Business Studies, Design and Technology, Home Economics, and ICT diversified the school curriculums and teachers should be made aware of these programs and trained to teach them.

The proposals of the National Policy in Education from 1977 to 1994 were also strategically implemented through National Development Plans 7 (1991), 8 (1997), 9 (2003), and 10 (2008). Achievements were made in student enrolments, because schools expanded and 84% of teachers were trained in 1991 as compared to 61% in 1978, showing an increased growth rate and upgrading to higher levels, which facilitated access to education for the majority of the Botswana nation (Letshabo, 2000). The National Development Plan 10 (2008) outlined that quality education remained the key issue for the education and training sectors. As a result, it was emphasized that the quality of teachers was critical to the quality of education. In this regard, National Development Plan 10 (2008) states that, "Primary Teachers' Certificate holders were upgraded to Diploma through institutional training and distance education" (p. 98). The teachers in primary schools were upgraded to the diploma level through the distance education offered by the University of Botswana. The University of Botswana expanded its programs by offering more courses.

Although the University of Botswana offered more courses and programs, the government of Botswana recommended the establishment of a second university of science and technology to offer advanced technology-based courses and programs. In 1998, the first open and distance learning institution called the Botswana College of Open

and Distance Learning was established and aimed "to extend education and training for out of school youth and adults using distance education learning methods" (Botswana Federation of Trade Unions, 2007, p. 8).

According to the Botswana Federation of Trade Unions (2007) the investments made by the Botswana government in education were no longer sustainable for continuing to offer free education, which was successful by then, and a cost sharing scheme was introduced during the National Development Plan financial year of 2002/03. Under this scheme, foreign and even local students were expected to pay fees as a means of cost sharing expenses with the government of Botswana.

Addressing the need for an ICT plan, the Botswana National Maitlamo ICT Policy was initiated and developed in 2005 (Botswana Draft National ICT Policy, 2005) and passed in 2007. The policy was to be used as "a vehicle for change and assist in achieving Vision 2016 and other national development targets" (Botswana Maitlamo National ICT Policy, 2007, p. 4). According to the report of the Botswana National Maitlamo ICT policy of 2007, the Botswana government, through the Ministry of Education, created an initiative through the Thuto-Net program by networking and connecting all schools and tertiary institutions so that all citizens could access equal education through flexible means to satisfy the National Education Policies.

The Maitlamo ICT Policy (2007) outlined the government as a catalyst, stimulator, model user, having a non-technical role to play, and an implementer that

encourages, promotes, and initiates ICT in all sectors of society. This National Maitlamo ICT Policy (2007) established Thuto-Net as a mechanism for connecting schools and universities to the rest of the world through technology. The policy emphasized a need for professional development programs for training teachers and school administrators on the use of ICT in schools. For example, a study conducted by Totolo (2007) investigated the likelihood of computer technology adoption among school principals whom were assumed to be transformational leaders. She identified that time constraints, phobia, a lack of skills or training, and a lack of practice with computers were barriers to the adoption process. Totolo recommended that training on computer use should be included as a strategy. The policy proposed that all schools should have computers and be connected to high-speed internet. The National Maitlamo ICT Policy (2007) principle was to provide easy access to information through computers, which is in line with the long-term plans of Vision 2016 (1997).

In summary, the policies attempted to take the education system of Botswana from an underdeveloped colonial infrastructure to a system of f2f teaching and education for all, and finally to provide education through the internet and computers. This means that the emphasis of the National Commission on Education (1977) and National Policy on Education (1977) was more on the classroom method of teaching as compared to the 1992/93 National Commission Policy on Education, Revised National Policy on Education of 1994, and Vision 2016 of 1997, which focused on the use of technology in the Botswana education system.

5.4 University of Botswana Policies

5.4.1 Overview

The University of Botswana established the Adult Education program in 1982, 16 years after Botswana's independence in 1966. The establishment of this program was in response to the concept of universal access to quality education through the guidance of Botswana's national policies on education, Vision 2016, the National Maitlamo ICT policy (2005/07), and the Tertiary Education Council (2008, a and b). Between 1982 and 1997 the education system in Botswana was going through changes guided by National Policies on Education (Republic of Botswana, National Education Policy, 1977, 1993, 1994) and the long-term Vision 2016 plan of 1997.

In 1982, Adult Education under the umbrella of the Department of Non-Formal Education was established to facilitate the process of making education more accessible to all adults, inclusive of out of school individuals who had dropped out of primary or secondary schools. The University of Botswana collaborated with the Ministry of Education on this adult learning idea in 1982 to establish an Adult Education department. It was during this period that the idea of distance education began in order to provide continuing, flexible, lifelong learning. It was emphasized in 1994 through the Revised National Policy on Education that accessing universal education meant reaching people in remote areas; that is why distance education was introduced. The University of Botswana started developing local institutional policies in line with the national education policies. The Revised National Policy on Education (1994) and Vision 2016 (1997) emphasized

technology in producing accessible quality in the education system. It focused on distance education as continuing education for lifelong learning, which was emphasized and implemented through National Development Plan 7 (1991), 8 (1997), 9 (2003), and 10 (2008).

As mentioned, during the colonial period the government trained teachers from Botswana through correspondence colleges in South Africa and Zimbabwe, and/or in the United Kingdom like Pitman and Damelin in the early 1960s. Botswana's education system during the colonial period did not have a well-developed infrastructure such as learning facilities, or qualified people in power to teach in schools. It was due to these reasons that few Batswana had secondary school and/or university degree qualifications by then. After Botswana's independence in 1966, tertiary education was proposed through a series of policies. The reason for the tertiary education proposal was based on a lack of qualified people in power during the colonial period. The section that follows describes how Botswana's national policies on education impacted on the University of Botswana after Botswana's independence in 1966.

The University of Botswana developed its policies based on the national policies to align its vision, mission, plans, objectives, and goals with it. The purpose of the University of Botswana's policies was to improve the accessibility of its courses and programs to the nation, providing access to all as their right to education.

5.4.1.1 Accessing University of Botswana Programs through Distance Education

This section focuses on how the University of Botswana intended to take national policies forward based on the adoption and diffusion of national policies into University of Botswana policies. Issues such as the enrolment of students, and quality of education, which involved the training of academic teachers, as well as the development of programs, and use of technology for teaching and learning, all had an impact on accessing University of Botswana courses and programs based on national policies.

The University of Botswana student enrolment plan of 2009 to 2015 (2008) was projected to be in line with the accessibility of education concepts and objectives established through national policies. For instance, it was reported in the University of Botswana 1997/98 Plan (1999) that student enrolment projections from 1997/98 to 2002/03 would increase from 6,831 to 10,970 as the aim was to increase the accessibility of university programs to the nation. The national education policies emphasized that student enrolment should be increased, providing universal accessibility of education to more students and adults. The national policies also stated that since universal accessibility of education leads to an increase in classroom size, enrolment should be limited from 40 to 30 (Republic of Botswana, Revised National Policy on Education, 1994).

The national policies' emphasis on the enrolment increase became a concern when it was stated that classroom sizes should be reduced, because an increase in student enrolment leads to a more complex classroom setup. For example, Eyitayo (2005) conducted a study at the University of Botswana and found that GEC 121 – Computing and Information Skills Fundamental I has large classes, with over 750 students per one lecturer with a lab demonstrator. The author said that students should be divided into several groups of 30 students. This idea at the University of Botswana of 30 students per group coincides with the national policies' objectives of reducing the classroom size from 40 to 30 (Revised National Policy on Education, 1994, Vision 2016, 1997).

The University of Botswana's programs were initially offered f2f in classrooms. The f2f concept is currently still used at the University of Botswana as was reported in studies by Masalela (2011) and Ntloedibe-Kuswani (2013). But since the aim has been facilitating the accessibility of education to all as stated by the national policies, it has come to a point where eLearning should be used to improve the classroom size and student enrolment (Eyitayo, 2005; Eyitayo & Giannini, 2004). The university policies aimed to get students to use computers and the internet to access materials and lecturers were expected to teach and give feedback in the same manner.

The University of Botswana Development Plan of 1997/98 (1999) coincided with the National Development Plan 8 (1997) based on the purpose of providing higher education at the University of Botswana to the Botswana community at large. University of Botswana beyond 10,000: A strategy for growth and shaping our future: A Strategic

Plan to 2009 and Beyond coincides with the National Commission on Education (1993) in that the university has committed itself to increasing educational opportunities in tertiary education through the distance education delivery mode (University of Botswana, 2000, 2004). The National Commission on Education (1993) recommended the provision of continuing education to young people and adults to enable them to further their academic and professional qualifications through part-time studies, workshops and distance learning. The University of Botswana intended to achieve this mission by providing continuing education to equip society with continuing education for lifelong skills to cope with existing and future problems in a rapidly changing world and to diversify the methods of delivery of its academic programs in order to enhance access to higher education.

The national policies emphasized that it is very important to train schoolteachers as the quality of education across the country is based on their quality of knowledge and skills (National Commission on Education, 1977). The National Commission on Education (1977), Revised National Policy on Education (1994), and Vision 2016 (1997) emphasized quality of education based on the professional development and training of school-teachers and higher education lecturers.

The national policies in early 1977 were focused more on training teachers, which informed the University of Botswana Learning and Teaching Policy (2008f) in implementing and taking forward the objectives of national policies by stating that one of its purposes is “To ensure professional development by training and developing academic

staff, promoting them, and maintaining quality assurance teams at Departmental and Faculty levels" (p. 7). The University of Botswana Information Technology Policy (2003) also states that, "There shall be a coordinated approach to training of staff and students in order to ensure that they can maximally utilize information technology resources provided within the University" (p. 3).

The University of Botswana training policies for lecturers included the use of technology such as eLearning in teaching and learning. Lecturers were given professional development and trained through the Centre for Academic Development (University of Botswana, 2009). The use of technology was emphasized by national policies on education to facilitate the accessibility of education to all. According to University of Botswana reports, facts and figures, student enrollment increased (University of Botswana, 2006, 2008: b, c, d, e, 2012). This student increase was the basis on which technology was to be used to facilitate the accessibility of university programs and courses to the community. The University of Botswana implemented eLearning technologies in 2001 to be used in teaching and learning for accessing programs and courses by students and the community at large. For instance, Thurab-Nkhosi, Lee, and Gachago, (2005) conducted a study at the University of Botswana and found that,

> … like many academics in institutions of higher education, University of Botswana lecturers are experts in their disciplines but have limited experience with course design and with the use of ICTs in the delivery of courses and programs. For this reason, University of Botswana initiated a system of training through the Department of Educational Technology Unit in the Centre for

> Academic Development that would build members' capacity for systematic course design and encourage the use of ICTs in the teaching and learning process (However, like many academics, … para. 2).

The University of Botswana's lecturers were trained through the Centre for Academic Development on how to use technology. Elearning at University of Botswana was implemented and lecturers were trained on how to use technology in teaching and learning (Mutula, 2002).

Although some lecturers used eLearning tools such as computers, the internet, and Learning Management Systems, i.e., Moodle, Blackboard, and WebCT, many were reluctant to use these new avenues. For example, Thomas (2008) based on a study he conducted, provided some insights into the progress at the University of Botswana in integrating instructional technology in its teaching and learning processes. He reported that in the previous five academic years, from 2002 to 2007, there was a declining trend in the technology diffusion process, which continued even to the end of 2006/07. One of Thomas's (2008) recommendations was that "All lecturers in addition to basic computer literacy should be trained to obtain a University of Botswana Advanced eLearning certificate" (p. 123). The University of Botswana's information technology policy (2003) states that lecturers should be trained to use information technology services in teaching and learning courses and programs.

The University of Botswana further facilitated accessibility to higher education when they set up courses and programs through distance education so that learners could

access them at any time and from anywhere. The University of Botswana had to make sure the following were in place because they facilitated the process of accessing university courses and programs at any time and place: a digitized library for learning materials to be accessed at any time and place, learner support services to support the learners when the need arises, the training of academic teachers as discussed above, ICT services, and developing learning materials. The next section discusses how the University of Botswana developed courses and programs with technology to facilitate the accessibility of education, courses and programs to the community at large.

The University of Botswana, through the Centre for Continuing Education, which was established in 1991 with the Department of Distance Education Unit, offered courses and programs within the framework of lifelong learning (Kamau & Selepeng-Tau, 1998). They offered these courses through part-time evening classes, distance education programs, training programs, professional development, and public education (Kamau, 1999; Kamau & Selepeng-Tau, 1998). They developed teaching and learning materials for courses and programs through a full-time f2f mode as well as distance education. As was previously noted, academic teachers for distance education courses were trained on how to develop the learning materials and use technology to facilitate access. For example, Kamau (n.d.) reported that the Centre for Continuing Education revised and updated the course materials that had been developed in 1982 for a Certificate in Adult Education program. She further stated that the University of Botswana through the Centre for Continuing Education developed course materials for B.Ed. and M.Ed.

programs and the Certificate in Accounting and Business Studies and Diploma in Accounting and Business Studies.

According to Kamau (n.d.),

> With the planned expansion of university enrolment beyond 10,000 (2000) in the next 10 years the Centre for Continuing Education in collaboration with other faculties has embarked on searching for readily available study materials to expedite the programs delivery process through open and distance learning (The Centre for Continuing Education - CCE, … para. 2).

It was on this basis that University of South Africa learning materials such as study guides were used in the process of developing learning materials for distance education programs at the University of Botswana. The development of course materials by the University of Botswana through the Centre for Continuing Education in the Department of Distance Education was in line with the aims of quality education emphasized by the national policies (Republic of Botswana: National Policy on Education, 1993; Revised National Policy on Education, 1994; Vision 2016, 1997). The section that follows discusses technology at the University of Botswana.

5.4.1.2 Technology at the University of Botswana

The Revised National Policy on Education (1994) and Vision 2016 (1997) emphasized technology in education systems focusing on continuing education for lifelong learning, which was implemented in National Development Plan 7 (1991), 8

(1997), 9 (2003), and 10 (2008). The University of Botswana aimed to take the university to the people through the distance education mode using technology. ELearning technologies were implemented in 2001 by the University of Botswana to facilitate distance education programs and courses. The University of Botswana developed the Distance Education Mainstreaming Policy (2005) based on national policies with the aim of increasing the accessibility of its academic programs to the nation. This policy:

> …refers to the incorporation of distance education into the institutional vision, mission, policies, and activities of the University of Botswana, which is a dual mode institution, so that it becomes a normal feature of mainstream thinking and practice (p. 5). This policy …is to exploit the potential of distance education in widening access to University of Botswana educational and training programs, the main purpose was to create an environment conducive for expanding the provision of high quality university-level distance education to Batswana and other learners, regardless of their location and time constraints (p. 7).

Bates (1992) cited in Nleya (2009) contends that, "technological decisions need to be preceded by policy and educational decisions" (p. 265). In this regard, Botswana has an international reputation for being relatively neutral in its policy-making. "The success of policy initiatives, as reported by Nleya (2009), which are supported by sound diffusion strategies, portrays Botswana as prime ground for technological transformation" (Relevant Literature, Par. 3).

The purpose of the University of Botswana in introducing the Distance Education Mainstreaming Policy (2005) and technology use in education was to respond to the national education policies on issues such as global challenges and the facilitation of free access to education to the nation. Studies conducted on eLearning and related areas

emphasize the use of technology, computer training, and awareness in schools, technical colleges, and universities (Batane, 2004; Bose, 2005; Kyeleve, 2000; Mooketsi, 2002; Nganunu, 1993; Ojo & Awuah, 1998; Sathiaraj, 2003; Uys, 2001; Wilson, 2006).

In brief, the University of Botswana after independence in 1966 took a further step in developing their policies in line with national polices and implementing them in the university curriculum for teaching and learning. The University of Botswana increased student enrolment, trained academic teachers in areas like the use of technology and encouraged the distance education delivery method to include student-centred independent study methods of teaching and learning.

5.5 Chapter Summary

The purpose of this chapter was to analyze secondary documents in Botswana from the national level to see how they impacted on the University of Botswana's education system. Botswana's education system after independence in 1966 when the two main national educational policies, the National Commission on Education (1977) and Revised National Policy on Education (1994), were introduced was discussed. It was found that the national policies strategically planned to develop Botswana's education systems by proposing more schools, and training teachers on the use of technology and flexible learning for continuing lifelong learning through the distance delivery mode.

These aims and objectives were implemented through the National Development Plans 6 (1985), 7 (1991), 8 (1997), 9 (2003), and 10 (2008).

The University of Botswana was discussed, focusing on the impact of the implementation of the national policies and their adoption by the university. The chapter also discussed the accessibility of university courses and programs and the use of technology. The University of Botswana developed its policies based on national policies and implemented them. Like national policies, the University of Botswana aimed to extend access to all learners in Botswana, including those in remote rural areas. Print-based distance education with specifically developed modules which intended to enable independent learning were mandated. Later, eLearning and technology use became the focus of these policies. The university mandated in its policies that lecturers should be trained to be able to use the new avenues and deliver programs and courses through both f2f and distance education, and ultimately move to online learning methods using technology. All in all, the policy environment at the University of Botswana promoted and supported extensive technology use and training.

CHAPTER 6 – RESULTS: PARTICIPANTS' PERSPECTIVES

6.1 Introduction

The University of Botswana was used as a case study to explore experiences of early technology adopters in the transition process from f2f to distance education to online, using print and online media. This data is important for gaining an understanding of how these early adopters experienced technology. The focus of this chapter is to explain how the participants taught and what technologies they used.

Nine participants[4] were purposively selected from the Department of Adult Education in the Faculty of Education to take part in this study. The Department of Adult Education is an important department in the university. Part of its mandate is to implement policies by extending access to education. This department drew specialist academics (i.e. specialists in sociology, business, computer sciences, education, communication) who were also educated in adult education. They were selected because they had taught f2f courses that had been converted to distance education courses and expected to teach online using online technology. All nine participants were identified as early adopters of technology use in teaching and learning. Names and course codes have been changed to protect the participants' privacy and confidentiality (see Appendix D).

[4] Participants' names were not used for confidentiality reasons as noted on the consent form. The names that appear here were created and does not represent the identity of any of the participants.

This chapter is organized into four sections to report the results with verbatim excerpts. The first section presents brief demographic information that describes the population studied as shown in Table 6.1. Secondly, teaching and learning artifacts are described. These are the teaching and learning materials used by lecturers in their f2f classrooms, in distance education, and in online learning. Thirdly, profiles of the participants are presented to show how they used technologies in teaching. A discussion follows this section that links the demographic information, profiles, and artifacts.

6.2 Demographic Information

The purpose of the demographic data in this study is to provide a description of the participants studied as noted in Table 6.1. The study identified and described six main demographic variables from the sample: gender and age, position of responsibility, years of experience in teaching and technology used, education levels, courses taught and method of delivery used.

6.2.1 Gender and Age

All nine participants taught in the Department of Adult Education. As can be seen in Table 6.1, there were five men and four women in this study. Two of the men were between the ages of 40 and 49. Six of the participants were between the ages of 50 and 59 and one woman was between 60 and 65.

6.2.2 Position of Responsibility

Participants' ranks ranged from senior lecturers, to professors, to Head of Department. These ranks usually corresponded to the length of time worked and education level. For example, as reported in Table 6.1, participants with a master's degree were still at the rank of lecturer, while participants with PhDs tended to have moved up the hierarchy. According to the demographic information, the participants Oratile and Lesego were the longest serving lecturers, having worked at the university since 1992 with 22 years of experience. They had been promoted from lecturer to full professor. Oratile was also a Head of Department. Lesego said:

> I am a trained , and I am also a trained adult educator, when I joined the university in 1992 I was from the government, from the Ministry of Agriculture, where I was working as a …

Whereas, Oratile said: "I came into the department as a staff development fellow in 1992". The participants with PhD degrees (Kutlo, Mpho, Itumeleng, and Serero) were promoted to a senior lecturer position based on the number of years served at the University of Botswana, whereas those with a master's degree (Keitumetse, Mmapula, and Lorato) were still lecturers. Keitumetse joined the University of Botswana in 2010 on a temporary basis as an adult education lecturer and had been in that position for two and a half years.

6.2.3 Years of Experience in Teaching and Technology Used

Table 6.1 shows that participant experiences were different in teaching and the use of technology. Some participants, both with and without PhD and master's degrees, had taught for a range of years (see Table 6.1). For example, Kutlo had served in the Department of Adult Education since 2000 and in 2007 at age 47 he completed his PhD. He had 14 years of experience in f2f teaching and nine years of experience in distance education. Oratile, on the other hand, was a lecturer from 1992 until 2002 when he completed his PhD. Lesego also had 22 years of f2f and distance education teaching experience and she completed her PhD in 1999. However, Serero completed her PhD in 1996 and joined the teaching service in the Department of Adult Education in 2010. She had fewer years of teaching experience before finishing her PhD degree and started accumulating teaching experience after joining the University of Botswana and began academic teaching in the Department of Adult Education. Keitumetse, Mmapula, and Lorato taught with master's degrees. They joined academic teaching positions with some teaching experience (see Table 6.1). Oratile said: "… I started teaching the course until I went to school for my master's degree in 1993/94 …". Lorato talked about her experience: "I would say … I started off as a secondary school teacher, …, I taught at junior school … at senior school, … colleges of education before I came here, …".

The participants' experience in teaching and use of technology varies (as in Table 6.1). Some of those with PhD degrees were experienced teachers before joining the academic field, while others were not, and those with master's degrees also had teaching

experience before serving in the Department of Adult Education. This shows that, on average, participants were more experienced in f2f teaching and had less distance education teaching experience.

Although participants generally used some technology in teaching, the results of the study showed that participants mostly used technology for learning when pursuing their master's and PhD degrees. Although some technology was used in teaching, participant experiences with technology were generally lacking. Technology use is further discussed under the participant profiles. For example, Lesego said: "I have teaching experience and expertise on adult education and on distance education and face-to-face delivery methods but [have] limited experience with technology".

6.2.4 Education Levels

Table 6.1 shows that six participants had completed PhD degrees. Some had completed their PhDs early in their careers while others finished much later. Three of the participants had a master's degree. Of those holding master's degrees, one of them had been pursuing a PhD on part-time basis since 2013. Lesego was sent by the University of Botswana to complete a PhD abroad. She said "I am a specialists with a first degree, master's degree, and PhD in adult education". Similarly, many specialized in a discipline before joining adult education, like Keitumetse, Mpho, Serero, and Lorato.

Table 6.1

Participant Demographics

		Participants									
Demographics	**Categories**	**Kutlo**	**Itumeleng**	**Mpho**	**Keitumetse**	**Oratile**	**Lesego**	**Serero**	**Mmapula**	**Lorato**	**Totals**
Age	40 – 49	1	-	1	-	-	-	-	-	-	2
	50 -59	-	1	-	1	1	1	1	-	1	6
	60 – 69	-	-	-	-	-	-	-	1	-	1
	Totals	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**9**
Gender	Males	1	1	1	1	1	-	-	-	-	5
	Females	-	-	-	-	-	1	1	1	1	4
	Totals	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**9**
Education Level	Masters										
	1970 – 1990	-	-	-	-	-	-	-	1	-	1
	1990 – 2000	-	-	-	-	-	-	-	-	1	1
	2000 – 2010	-	-	-	1	-	-	-	-	-	1
	PhD										
	1990 – 2000	-	-	-	-	-	1	1	-	-	2
	2000 – 2010	1	1	1	-	1	-	-	-	-	4
	Totals	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**9**
Courses	******F2F – XYZ	713	707	622	603/705	941	712	804	717	612	-
	******Distance Education – XYZ	604	706	622	603	601	720	711	712	612	-
Teaching Experiences – F2F	Less than 5 Years	-	-	-	1	-	-	1	-	-	2
	5 to 10 Years	-	-	1	-	-	-	-	1	1	3

	10 to 15 Years	1	1	-	-	-	-	-	-	-	2
	15 to 20 Years or more Years	-	-	-	-	1	1	-	-	-	2
	Totals	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**9**
Teaching Experiences – Distance Education	Less than 5 Years	-	-	1	1	-	-	1	-	-	3
	5 to 15 Years	1	1	-	-	-	-	-	1	1	4
	15 to 20 Years	-	-	-	-	1	1	-	-	-	2
	Totals	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**9**
Technology Used	PowerPoint	1	1	1	1	1	1	1	1	1	9
	Blackboard	-	1	1	1	1	-	-	-	1	5
	Facebook	-	-	-	-	-	-	-	-	1	1
	Cellphone	-	1	-	-	1	1	1	-	1	4
	Internet	1	1	1	1	1	1	1	1	1	9
	Email	-	1	-	-	-	-	-	-	-	1
	YouTube	-	-	-	-	-	-	-	-	1	1
	Computers (Laptops)	1	1	1	1	1	1	1	1	1	9
	Smart-Boards	-	-	-	-	1	-	-	-	-	1
	WebCT	-	-	1	-	1	-	-	-	1	3
	Moodle	-	-	-	-	1	-	-	-	1	2
	Total Number of Technology Used	**3**	**7**	**4**	**4**	**9**	**4**	**4**	**2**	**8**	**49**
Other Types of Telecommunication Device Used	Telephone (land line)	-	1	-	-	1	1	1	-	1	5
	Totals Used	**-**	**1**	**-**	**-**	**1**	**1**	**1**	**-**	**1**	**5**
Position of Responsibility	Lecturer	-	-	-	1	-	-	-	1	1	3

Senior Lecturer	1	1	1	-	-	-	1	-	-	4
Professor	-	-	-	-	1	1	-	-	-	2
*****Head of Department	-	-	-	-	*****1	-	-	-	-	*****1
Totals	**1**	**1**	**1**	**1**	***1**	**1**	**1**	**1**	**1**	**9**

Source: Demographic Information of Participants. ** Course Codes are (XYZ). The course codes and numbers have been changed to protect the participants' anonymity. *1 is both Head and Professor

6.2.5 Courses Taught

All nine participants taught through f2f and distance education as shown in Table 6.1 and Tables 6.3. Three of the participants, Mpho, Keitumetse, and Lorato, taught the same course using f2f and distance education while six participants taught different courses using both delivery methods. In addition, Lesego and Mmapula taught the same XYZ 712 course but used different delivery methods; Lesego taught XYZ 712 via distance education and Mmapula via f2f. Although some participants taught different courses with both delivery methods, the course content was the same for f2f students and distance education learners. Participants preferred to teach the same course f2f and through distance education but this was not always possible. Kutlo claims that: "… the benefit is, you know, reduced workload, because I don't have to prepare two separate materials for the same two groups, …". Tables 6.1 and 6.3 show the courses and content taught to both f2f students and distance education learners.

The participants generally taught courses specializing in specific areas within the adult education discipline; for instance, Oratile taught XYZ 941, and Mmapula taught XYZ 717. These participants are experts in their subject areas as well as in adult education. Participants used a prescribed textbook for each course in the f2f classroom, a module for distance education learners, and technology used (see Table 6.4). These are described in later sections. However, one course is described as an example here.

Participants generally taught courses based on their areas of expertise. For example, Keitumetse taught a course in adult education (XYZ 705) that was delivered f2f and through distance education. This is a three-credit course that is optional for Bachelor of Education students and a core course for diploma students. The XYZ 705 course is offered in the second semester. Generally, for this course and also for all other courses offered in adult education, objectives are similarly stated as outlined in the course outline below in Table 6.2. Below is an example of a course outline for XYZ 705.

Table 6.2

Objectives of the XYZ 705 Course

Objectives for Course Taught - XYZ 705
1) Critically analyze the concept of a learning organization and transferable skills in a global economy
2) Analyze how the concept of employee development and other principles like self-directed learning, critical reflection and lifelong learning apply to the workplace
3) Describe the delivery methods
4) Identify sectors

Table 6.3

List of Courses Taught Face-to-Face and for Sessional Teaching Distance Education

Tutors	Course Codes – F2F	Course Codes – Distance Education
Kutlo	XYZ 713	XYZ 604/705
Itumeleng	XYZ 707	XYZ 706
Mpho	XYZ 622	XYZ 622
Keitumetse	XYZ 603/705	XYZ 603
Oratile	XYZ 941	XYZ 710
Lesego	XYZ 712	XYZ 720
Serero	XYZ 804	XYZ 711
Mmapula	XYZ 717	XYZ 712
Lorato	XYZ 612	XYZ 612

6.2.6 Method of Delivery Used

The University of Botswana's goal was to offer courses to the community at large including through f2f, distance education, and online learning. Participants were hired with the expectation that they would deliver the courses using all modes of delivery. Since the participants were experienced teachers, they often used technologies that were compatible to their teaching context and experiences. However, the teaching methods used by participants varied. Kutlo said:

> I use the laptop for f2f classroom teaching, so at the end of the day to me the type of teaching method that the lecturer should adopt must be based on the ability of the learner to comprehend the issues. For example, to me it is not about technology all the time, even where people dictate, you know the dictation method sometimes is far better than the PowerPoint because when you dictate you more like explain the concept than having the student merely look at the board and record that in their notebooks.

The point raised by Kutlo was that lecturers should use the teaching method based on the learner's ability in understanding the concepts. Furthermore, he meant that rather than students copying from the board when material is projected through PowerPoint slides, it is better to use a method where students will listen and write what they understand. Kutlo emphasized that although technology is good to use in teaching, he felt that it can encourage a teacher-centered method rather than a student-centered approach.

Lesego, on the other hand, indicated that she approached her teaching for distance education learners and f2f students in the same way. She said:

> I use a similar f2f classroom delivery method used for f2f students for distance education learners when attending their residential sessions on campus and also in addition to the module to supplement it, I distribute same handouts used for f2f students.

The section that follows focuses on describing the artifacts, teaching and learning materials, and online technologies used by lecturers teaching f2f to distance education as reported from interviews and observations.

6.3 Artifacts and Technologies Used

The nine participants were requested to provide the researcher with the teaching and learning materials they used for the courses taught. The artifacts collected (teaching and learning materials) are compiled in Table 6.4 and grouped under f2f, distance

education, and technology (Learning Management Systems, Social Media, other technologies, and telecommunications media such as telephone) used. In addition, this section further reports findings as the results of what the researcher learned from lecturers' use of artifacts, secondary documents used for this study, interviews, and observations.

Table 6. 4

Artifacts Compiled

Face-to-Face Classroom	Distance Education	Technology Used
Textbooks	Modules/Workbooks	***Online Learning Management Systems:*** WebCT, Blackboard, Moodle
Tests/Exam Papers	Study Guides (from University of South Africa)	***Web 2.0 and Social Media:*** Google Search, Email, YouTube, Facebook, Internet (reading list)
Assignments		***Other Technologies:*** Personal Computers (Laptops), Smart-Boards, PowerPoint, Cellphones, Television
Course Outlines		***Telecommunications Media:*** Landline Telephones
Time Tables		
Practice Questions		
Handouts: Lecture Notes		
Journal Articles		
Reports		
PowerPoint Slides (had copies)		
Worksheets		
Library Materials		

Table 6.1 indicates the technologies each of the nine participants used. For instance, the types of technologies used by Lesego and Serero were cellphones, internet, PowerPoint, and personal computers, and telecommunications media: landline telephone. The technology used by Kutlo and Itumeleng were PowerPoint, internet, and personal

computers. Mpho and Keitumetse used Blackboard, a Learning Management System. Oratile and Lorato used the nine types of technology as noted on Table 6.1. Oratle used Blackboard, personal computers, telephone (telecommunications media), cellphones, internet, PowerPoint, WebCT, Moodle, and SMART Board, whereas Lorato did not use SMART Board but did use Facebook and YouTube. Thus, technology was used for teaching and learning.

6.3.1 Face-to-Face Classroom Materials

The participants in this study generally used lecturing as their method of teaching. Most used PowerPoint presentations with handouts to supplement the lectures, and students were also expected to buy textbooks. This section describes some of the commonly used f2f artifacts such as course outlines, assessment notes, textbooks, and class notes.

Course Outlines: All nine participants used a course outline, generally prepared by the lecturers, in their f2f classrooms as a planning and management tool to guide the students as they were required to do by the University of Botswana. These were distributed at the beginning of courses. Students were expected to have read assigned readings and to be prepared for classes based on the outline before coming to class.

Course outlines guide students on the specific content to be covered in the course and the mode of assessment. For most participants, as shown in Figure 6.1, course outlines contain a course introduction, rationale, objectives, and assessments. The course outline indicates a specific topic for each week with subtopics to be covered in a certain period of time. The course outline also generally contains the lecturer's contact information and classroom times and venues. The structure of the course outlines for all courses is the same as is suggested by the Department of Adult Education. Course outlines also contain some prescribed texts and recommended readings for students.

Course Outline

2013/14 Semester II

COURSE SYNOPSIS

This course is designed to help learners develop presentation skills using Microsoft PowerPoint; Introduction to spreadsheet concepts and principles; Use of basic spreadsheet application package facilities; Introduction to database concepts and principle.

AIM / RATIONALE:

This course offers a further introduction to the computer system environment and problem-solving with the help of the computer. The emphasis is on practical hands-on experience. The course helps students with understanding presentation skills. It will focus on equipping student basic spreadsheet and database skills. It will introduce further computing skills. The course will further equip students with basic ICT skills required for their academic work.

LEARNING OBJECTIVES

Upon successful completion of this course, students will be able to attain competency of each of the following, enough for them to teach themselves any more advanced related computer literacy material not covered in this course:

1. Presentation skills using Microsoft PowerPoint
2. Spreadsheet skills using Microsoft Excel
3. Introduction to Databases using Microsoft Access

1. Presentation Basics

1.1 Introduction

- Understand concepts and principles of multimedia information presentation
- Good practice in creating presentations
- Understanding different audience types (professionals, students, etc.)
- Creating presentations for different audience types

1.2 Basic operations

- open and close a presentation application
- open and close a presentation document
- use application help functions
- Understand layouts, templates, and themes

(Using MS ACCEESS)

3.4 **Tables**

- Create tables in design view, specify various data types for fields
- Specify primary keys
- Enter records using datasheet view
- Modify records

3.5 **Relationships**

- Different types of relationships
- Referential Integrity

3.6 **Forms**

- Create simple forms : (wizard and design view(
- Use forms to enter data into a tabie / query
- Create forms with sub-forms

3.7 **Queries**

- Create simple queries in design view
- Create advanced queries: update, delete, append, crosstab, and make-table

3.8 **Reports**

Create simple reports using the report wizard

Create advanced reports in design view

3.9 **Macros**

To automate the database

3.10 **Import/Export of Data To/From Access Databases**

3.11 **Printing all objects**

TESTS DATES

TEST 1: Thursday 6th March 2014

TEST 2: Thursday 17th April 2014

PRESCRIBED READING

1. Lecture and Practical lab manuals (availabe online through WebCT) **(To be revised)**
2. Any suitable Text books on PowerPoint, Spreadsheet and Databases application packages
3. Computer Based Tutorial and internet resources

Figure 6.1. Example of a Course Outline for Face-to-Face Students

INTRODUCTION

Week 1: ***January, 23***

Overview of the course; the meaning of adult education

- Key Reading:

Lindeman. E. (1926/1989). The Meaning of Adult Education: a classic North American statement on adult education (4th Ed.). Oklohoma city: Oklohoma Research Centre of continuing Professional and Higher Education.pp. 3-19 (http://www.infed.org/thinkers/et-lind.htming;

Task 1 : What did Lindeman (1926) think of both education and intelligence how does his views compare to us today? (Group member)

Merriam,S.B. & Brockett,R.G. (2007). *The profession and practice of adult education.* San Francisco: Jossey Bass. Chapter 1.

Also see www.infed.org/lifelonglearning/b_adedgn.htm AND

http://www.unesco.org/education/aladin/paldin/pdf/course01/unit_03.pdf

Oduaran, O (1991) Fundamentals of adult Education. Benin City: Nigerian Educational Research Association. (What is and the varieties of adult education) (Class member)

National Commission on Education. (1993). *Report of the national commission on education.* Chapter 8. Gaborone: Government Printer.
How is adult education viewed in Botswana?

TOPIC 1: HISTORY AND ADULT EDUCATION

Week 2: ***January 30th***

The nature of history and the usefulness of historical method in adult education

- Key Readings:

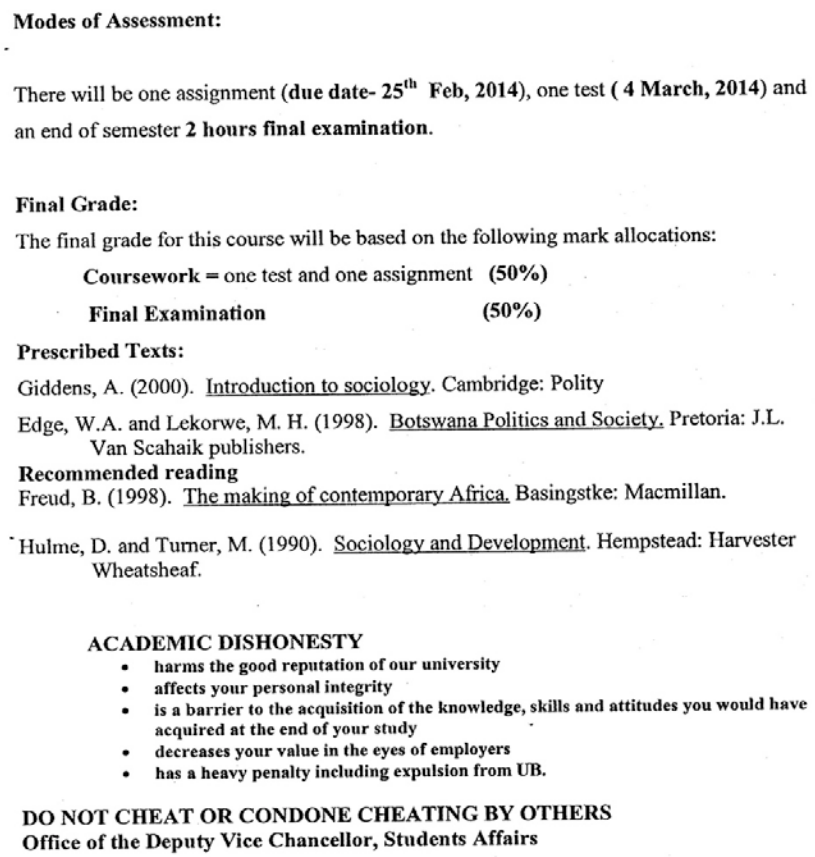
Merriam,S. B. & Brockett, R.G. (2007). *The profession and practice of adult education.* San Francisco: Jossey Bass. Chapter 3.

Omolewa, M. (2000) Setting the tone of adult and continuing education in Africa. In S. Indabawa, A. Oduaran, T. Afrik, S.Walters (Eds). *The state of adult and continuing education in Africa.*(pp. 11-18) Windhoek: Department of Adult and Non formal Education. University of Namibia.
http://www.historians.org/pubs/free/WhyStudyHistory.htm

- Assignment set (see below)

Assessments Notes: Assessment notes are handouts given to students. They contain information about the course assessment. Common assessments are assignments/projects, tests, and examinations. Modes of assessments as shown in Figure 6.2 are included with other forms and total 100%. Assessments could be in the form of students having to review a book for instance (30%), written assignments (40%), open

book tests (20%), and lifelong learning skills such as critical thinking, problem solving, and creativity, and class participation (10%), which all totaled 100%.



Modes of Assessment:

There will be one assignment (**due date- 25th Feb, 2014**), one test **(4 March, 2014**) and an end of semester **2 hours final examination**.

Final Grade:

The final grade for this course will be based on the following mark allocations:

Coursework = one test and one assignment **(50%)**

Final Examination **(50%)**

Prescribed Texts:

Giddens, A. (2000). Introduction to sociology. Cambridge: Polity

Edge, W.A. and Lekorwe, M. H. (1998). Botswana Politics and Society. Pretoria: J.L. Van Scahaik publishers.

Recommended reading

Freud, B. (1998). The making of contemporary Africa. Basingstke: Macmillan.

Hulme, D. and Turner, M. (1990). Sociology and Development. Hempstead: Harvester Wheatsheaf.

ACADEMIC DISHONESTY

- **harms the good reputation of our university**
- **affects your personal integrity**
- **is a barrier to the acquisition of the knowledge, skills and attitudes you would have acquired at the end of your study**
- **decreases your value in the eyes of employers**
- **has a heavy penalty including expulsion from UB.**

DO NOT CHEAT OR CONDONE CHEATING BY OTHERS
Office of the Deputy Vice Chancellor, Students Affairs

Figure 6.2. Modes of Assessment

Assignments: Face-to-face students are expected to complete at least one written assignment, as shown in Figure 6.3 for continuous assessment. One participant said: "I give the students individual assignments, and allow them two to three weeks to research and then write the assignments" (Keitumetse).

THE UNIVERISTY OF BOTSWANA

DISTANCE EDUCATION UNIT/CCE)

Semester two 2013/2014

Assignment (50 marks): Due 20th February, 2014

PART ONE: Write a research problem of your research proposal

Identify a research topic of interest to you. Then write the research problem section of the proposal. In writing your research problem, you are advised to follow, as much as possible the following format:

- Topic area (1 marks)
- Statement of the Problem (10 Marks)
- Purpose of the study (2 marks)
- Research questions/objectives of the study (6 marks)
- Importance/significance/justification of the study (6 marks)

---

25 marks

PART TWO: write a critical review of the literature for your proposed research study

Using the same research problem that you described in ***Part One*** above review the related literature. In writing this chapter, please use the following format

- A brief introduction (5 marks)
- Review the literature by doing the following: (15 marks)
  - *Organize your literature review (i.e. summarize conclusions according to themes relevant to your study)*
  - *Critique the literature (i.e. interact with the literature by responding and commenting. Remember that relevant studies need to be critiqued not reported. Use your own words (i.e. only use quotes to support your conclusions and arguments)*
  - *Identify gaps in the literature, this is crucial for situating your own study in reaction to existing information or previous work)*
- Chapter summary (5 marks)

25 marks

Note: That;

i) You are expected to demonstrate sound knowledge of social scientific research principles and some evidence of reading on the subject matter to be investigated.

ii) Quotations and citations should follow the "student style guide i.e. APA format of the Faculty of Education

iii) The assignment will be marked out of ***(50).*** It will be assessed in terms of clarity, logic of the presentation and the ability to apply research principles.

Length: 3-5 pages typed

Due Date: This assignment is due on February 20th, 2014. Late submissions will be governed by the appropriate Faculty of Education regulation.

Department of Adult Education

Figure 6.3. Example of an Assignment

Tests and Examinations: Students are given a test during the course and an examination at the end of semester. The final grades are based on course work and a final examination, constituting 100% of the total marks as shown in Figure 6.4.

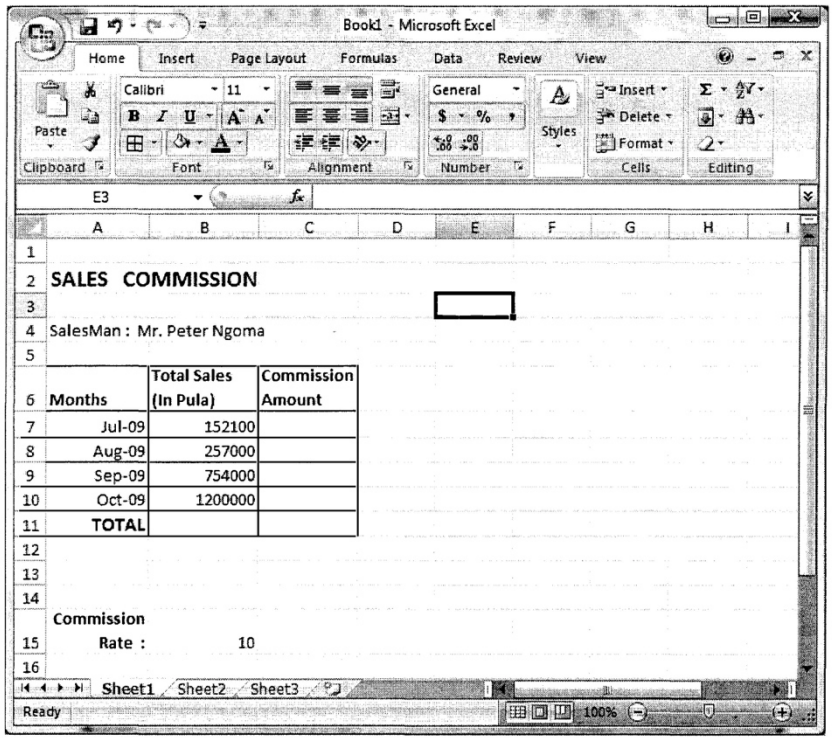
The tests usually cover material done at a specific time in the process of the course, whereas examinations are held at the end of the course and generally include work covered in assignments and tests. The nine participants usually distribute assignments, tests, and examinations to f2f students in class when the time comes to test them. Similarly, distance education learners also write the tests and examinations, similar to f2f students during the f2f classroom residential sessions.

QUESTION 3

a. List two uses of Microsoft Excel. [2]

b. Write down the steps to insert a column after column-D [2]

c. Refer the following worksheet and answer the questions from (i) to (v)



i. The commission rate given in cell B15 is in percentage. Write down the formula to calculate the commission amount for the month of July 2009. [3]
(Note : When your formula is copied for other months, the same commission rate has to be used by the system)

ii. Write a function to find the total commission earned by the salesman for all months [2]

iii. Write down a function to calculate the average sales from July to October 2009 [2]

Figure 6.4. Examples of Tests and Examinations

Textbooks: The participants indicated that they provide additional learning materials to f2f students to supplement their readings. These consist of practice questions, additional reading lists, lecture notes, reports, and journal articles. The students are expected to read materials in advance before coming to class to be able to

participate in classroom discussions. Textbooks are prescribed for each course, with generally one textbook per course, and participants said they keep some books specifically for the course on hold as reserves in the library to supplement the readings. The students are expected to access these books from the library and read in preparation for the next class lessons. Mpho noted that: " … with the f2f one, we don't have a tailor-made textbook. We prescribe off the shelf textbook …". What Mpho meant here was that although f2f students do not have tailor-made textbooks like the modules in distance education courses, they have a book prescribed for the course which they use. This means that both the f2f students and distance education learners, in addition to the module, use textbooks specifically prescribed for the course.

Class Notes: In addition to textbooks, the lecturers develop notes for the students to supplement their readings. The notes are based on the course material, prescribed textbooks, and reserved library materials. Students are expected to read these notes in addition to the prescribed textbook.

6.3.2 Distance Education Materials

Distance education artifacts are those materials developed by lecturers for distance education learners as listed in Table 6.4. Lecturers who teach f2f students are called 'tutors' for distance education learners. The title of 'tutor' is given to highlight the transition from lecturing f2f to distance education facilitation. Modules and materials are

developed specifically for distance education learners. These modules are comprehensive course notes as noted in Table 6.4 and used as textbooks. The modules are independent study materials and represent the lecturer's presence when the distance education learners study on their own away from the University of Botswana.

In addition to individual independent study, distance education learners attend residential sessions at the University of Botswana in f2f classrooms with a lecturer who tutors them. These f2f classroom residential sessions are scheduled for one week inclusive of the weekend per semester. The lecturers are expected to tutor them, and at the end of the week give them an examination or test similar to the ones f2f students receive. The lecturing and testing of f2f and distance education learners was expected to have been completed in one week because it was expected that the distance education learners would independently complete all the work assigned to them. These sessions run when the university campus is closed for f2f students or when they are on break so that resources are shared and used by and for distance education learners only. These f2f sessions are meant to assist distance learners in clarifying what they did not understand from learning on their own. However, the tutors end up lecturing (giving them information) because learners often fail to complete the school work assigned to them for a number of reasons including, a lack of understanding and low levels of English. At these residential sessions, participants reported that they tend to use lecturing as the method of teaching and learning with distance education learners.

The modules are commonly referred to as workbooks and form a key component in the delivery of teaching and learning in distance education. Mpho said: "The workbook is tailor-made specifically for this course we are teaching". The modules provide information on all the units, and distance education learners can study the units at their own time, pace, and place. These modules are print-based, and distance education learners obtain them during the residential sessions or via mail.

The modules generally contain units similar to the f2f course outlines, except that they have more detailed comprehensive information, including course content. Typically, a module represents the presence of the lecturer, and includes the outline, objectives, assessments, weekly topics, content, and practice questions and assignments. Distance education lecturers do not need to produce supplementary teaching and learning materials because the modules are comprehensive. However, the participants said they were often under pressure from the University of Botswana administration to complete the syllabus by the end of the semester, so they provided distance education learners with additional materials. These materials were often the same as those used by f2f students. As one of the participants remarked: "… when you read the module you find that everything has been simplified and even examples given, so that it actually simplifies everything for a distance education learner, unlike the f2f students …" (Keitumetse).

At the University of Botswana, the Department of Distance Education Unit in the Center for Continuing Education is responsible for coordinating the planning, facilitating and producing of the modules for distance education learners. This is a common practice

in Southern Africa, where there is a unit specializing in adult education. The University of Botswana follows the model of the modules and study guides developed by the University of South Africa. The University of South Africa was a pioneer in print-based distance education materials. As such, the Department of Distance Education Unit brings together a distance education specialist with a subject expert to develop the modules. The distance education specialist from the Department of Distance Education Unit provides guidance and training to the subject expert on developing the modules according to adult education teaching and learning principles. The lecturer who teaches the f2f courses often develops the module but this is not always the case.

Once the modules are developed, the subject expert may move on to other courses and a new lecturer will be assigned to take over delivery of the distance education course. The new lecturer, then, will have had little input in developing the distance education course. Once a module is developed, little re-development takes place. According to the participants, the modules are updated but not re-developed. Some of the participants in this study, Lesego, Oratile, Kutlo, Lorato, and Itumeleng, developed their own distance education modules for the courses they taught, whereas Mpho, Keitumetse, Serero, and Mmapula taught courses using modules developed by others. Mpho reported: "I have never been trained, nor attended a workshop, to be professionally developed on how to teach distance education learners, and develop their learning material in the form of a workbook, which is the module".

Similar to Mpho and Keitumetse, Serero claimed that from the beginning of her involvement in teaching distance education courses she had not been trained to teach distance education nor had she developed a module. Mpho also used a module that had been developed by others, which he said was now outdated.

On the whole, distance education learners were taught through two ways: (1) modules, which were developed using adult education teaching and learning principles and were designed for independent study, which is generally student-centered; and (2) lectures similar to what f2f students received, which were conducted during residential sessions on campus. The Department of Distance Education Unit adopted a particular format for modules, which is used universally in distance education. The format is user-friendly and intended to aid in independent learning. An example of a module is provided in Figure 6.5 and the general structure of the module is as follows:

1. Overview
2. Objectives
3. List of topics to be covered
4. Examples
5. Self-assessment activity to be done by the learners
6. Questions
7. List of references and further readings

UNIVERSITY OF BOTSWANA

DEPARTMENT OF ADULT EDUCATION

DISTANCE MODE MODULE

COURSE DAE

ABOUT THE MODULE

OVERVIEW

The communities in Africa and in Botswana in particular are submerged in poverty, hence the need to empower them economically. The recent years have witnessed the emergence of community enterprise and economic projects under the auspices of Non-Governmental Organisations (NGOs) and Community Based Organisations (CBOs) as well as those that are initiated and run by individuals within the communities. However in this module our interest is not in those projects and enterprises that are privately owned. It is in those community enterprises and economic projects that are geared towards community development. The strong conviction that influences the decision to invest time and energy discussing the community enterprises and projects is because they are seen as the pillars in the development of the communities. This observation is well supported by Hamilton (1992) who stated that, "Community development is usually thought about and discussed in purely economic and political terms" (p.29). The strong belief is that if economic empowerment is realized then political and social empowerment will follow easily. Therefore the economic empowerment process is highly essential if communities are to develop. The Bahai International community Office (2002/20/20) in support of the idea of economic advancement states that, "it is unrealistic to imagine that the vision of the next stage in the advancement of civilisation can be formulated without a searching re-examination of the attitudes and assumptions that currently underlie approaches to social and economic development (p.1). It becomes clear that economic development is important for communities to improve their socio-economic status. According to the World Bank as cited by Chambers (1983) "Rural development is a strategy designed to improve the economic and social life of a specific group of people – the rural poor" (p.147). In order for the rural populace to benefit from the fruits of development, the need for their economic empowerment becomes even more fundamental. It is in this light that I put forward to you this module. This I am highly optimistic that it will help you as an adult educator or change agent and also help you help others.

The topics that are covered in this module will help you to become more informed in the field of project and enterprise management. The presentation of the information is made with the aim of demystifying those concepts that you may have in the past considered as complicated.

The manner in which the module is written invites you to compare what is written here with you own experiences. The module is categorized in units that are closely related and I hope that you will find going through them interesting.

I wish you the best in studying the module.

Thank you!

General Objectives of the module

Upon successful completion of this Module you should be able to:

- Analyse the general principles and values behind community enterprises and economic projects, particularly in the African context
- Critically analyse factors that should be considered in choosing economic activities, including exploration of the gender perspective
- Effectively provide their services to communities in terms of business knowledge and skills as "business advisors"
- Show a critical awareness of the constraints and cultural contexts for community enterprise development and adult education in Botswana

UNIT 1

Some common issues related to community enterprise and economic projects

Overview

In this unit I shall help you to understand the importance of enterprises and community projects. The unit will examine the concept of community projects and enterprises and lay it into perspective. The unit will further look at the types of activities that are essential in a small business. The capital investments that are necessary will be discussed as well as the opportunities that must be harnessed if the enterprise is to be competitive and successful. The importance of resources in any business undertaking will form part of the crucial discussion in this unit.

In order for you to stay focussed and to benefit immensely from the unit I have formulated the objectives for it. The following are the objectives of the unit.

As having successfully completed this unit you should be able to:

- Define the concept of community project and enterprises
- Identify the types of activities for small businesses
- Identify the types of capital investments
- State the importance of resources in the running of community project or enterprise.
- State the importance of collaboration and participation in the global market

8. *Fire insurance*

This is the type of insurance that covers properties against the risk of fire.

? ?

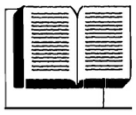
What type of insurance will you prefer for a community project or enterprise and why?

SELF-ASSESSMENT ACTIVITY

Define, the concept of insurance and justify its importance in the community projects and enterprises

REFERENCES

Wokorach, J. (1999) *Commerce. A Complete course.* Mochudi: Salama Publishers.



FURTHER READING

Birds, J. (1979) *Insurance.* London: Sweet and Maxwell.

Figure 6. 5. Example of a Distance Education Module for Adult Education

In the module, icons are used to guide the distance education learners (see Figure 6.5). For example, a hand holding a pen indicates a self-assessment activity, and a picture of an open book indicates the learner is being referred to further readings. The module is written in accessible English so that distance learners can follow along easily. The purpose of the module is to represent the lecturer's presence in absentia. At the end of each module there is a summary of all the units covered with some practical exercises to

do, and an assignment as a self-assessment for practice. The modules and any supplementary materials are distributed to distance education learners during the residential sessions on campus and those who fail to collect them receive them through the mail wherever they are located.

6.3.3 Online Learning Materials and Technologies Used

Online learning materials refer to electronic media used in teaching and learning for both f2f and distance education at the University of Botswana. Participants' responses on online learning materials showed that they used some technology for f2f and distance education modules. In addition, they were aware of and familiar with technologies used for online teaching and learning such as Learning Management Systems such as WebCT, Blackboard and Moodle, as well as social media, and other technologies (personal computers, smart-boards, and cellphones) (see Table 6.4). In addition, some participants indicated they used telephones (cell and landline) to contact students.

The Centre for Academic Development provided the nine participants with training on Learning Management Systems and other technologies such as personal computers and SMART boards. Participants also used PowerPoint presentations, emails, Facebook, YouTube, cellphones for calling with text messaging, and telephones as telecommunications media. As shown in Table 6.1, Blackboard was used in f2f classroom teaching by four participants, one participant used Facebook for f2f students,

three participants used cellphones for calling and text messaging in distance education, and four participants used landline telephones for distance education as telecommunication media. Participants used technologies like cellphones and telephones because these were accessible to distance education learners.

The lecturers said they used online technologies to post materials online for f2f students to facilitate asynchronous learning. However, participants noted that students often did not access the materials posted online even though they had access to University of Botswana computers for synchronous learning. For instance, Oratile used Blackboard, Moodle, and WebCT. This is what he said:

> In the f2f program we do have courses uploaded on the Blackboard and Moodle and so on like in my case I use the Blackboard, so this is where I interact with the students. They can participate in discussions and I send them messages through the Blackboard and so on.

Lorato said that she was the first one to use WebCT in the University of Botswana. She used to post materials for f2f students to read in advance before coming to class and also used it as a discussion forum, although she also commented that students often fail to access it. Lorato later began using Blackboard instead, which she said was introduced after WebCT.

The University of Botswana started using WebCT as a Learning Management System. This was later changed to Blackboard and then recently Moodle was introduced, which is not commonly used compared to Blackboard because participants are still

struggling to learn and use Blackboard. Participants noted that new technologies were introduced before they even understood how to use the previous one. They claim that the University of Botswana does not allow them time to learn how to use and practice these new technologies. These Learning Management Systems have common tools with some slight differences as noted by Lorato and Oratile, the main users. The most commonly used Learning Management System was Blackboard, which has tools such as discussion forums, content delivery, and a chat area. The lecturers repeatedly mentioned that f2f students were not using the tools. They also stated that distance education learners were often not connected to the internet or did not have access to computers so they were less likely to access online materials. Participants in this study often tried to contact their distance education learners by using text messages via cellphone, and by calling and talking to them on landlines. Again, the lack of technology infrastructure in the remote rural areas hampered this process. Most distance education learners are located in remote rural areas.

Given the lack of technology infrastructure, the most commonly used technology among participants was PowerPoint presentations in both f2f and distance education. PowerPoint slides were posted online through Learning Management Systems like Blackboard before class; however, many of the lecturers noted that students never accessed them. When distance education learners attended residential sessions on campus PowerPoint slides were also commonly used. Participants said that PowerPoint is compatible with their teaching context because they project the slides on the classroom screen board and go over them to explain concepts. They also distributed PowerPoint

slides as hard copy handouts to students. Mpho said: "I can carry just a memory stick and use it in f2f or distance education residential session classroom by inserting the memory stick in the computer, then projecting the PowerPoint slides on the blackboard".

Briefly, in examining the artifacts the following points were highlighted: 1) The lecturers were all early adopters of technology. They used various types of technology for specific purposes. Participants' rates of technology adoption varied as some consistently used technology, like Lorato, Mpho, Kutlo, Oratile, and Keitumetse; while others used technology only sometimes such as Serero and Mmapula; and others like Lesego and Itumeleng used it sporadically. (2) Blackboard for online learning was the most commonly used Learning Management System and the specific tools used were content delivery, chat rooms, and discussion forums. (3) All participants noted that both f2f students and distance education learners did not access online materials, which negatively impacted their use of online and other technologies (see Table 6.4). (4) All participants used PowerPoint slides, as this was compatible to their teaching context experiences. (5) Some of the participants such as Lorato were creative and showed initiative by using Facebook and YouTube, and in addition other lecturers (Serero, Lesego, Kutlo) used telephones, and cellphone texting. (6) More online media and other technologies were used by lecturers in f2f classrooms rather than in distance education learning.

6.4 Profiles of Participants

In this section, each of the nine participants' teaching strategies are described. These descriptions help the reader to understand what participants think about technology and their intention to transition from f2f to online distance education. These profiles are based on demographic information (Table 6.1), data from artifacts (Table 6.4), interviews, and observations (Table 6.5).

6.4.1 Kutlo[5]

Kutlo has been teaching for 14 years as a lecturer and then a senior lecturer. He completed his PhD degree in 2007. Kutlo has taught XYZ 713 f2f since 2000 and XYZ 604 as a distance course since 2005 (see Table 6.1; Table 6.3).

Kutlo said that he taught f2f students through lecture demonstrations and explaining on the classroom blackboard. During the classroom observations, some students attentively listened and commented or asked questions. Kutlo noted: "…when we use the actual blackboard, … we just use the classroom teaching style where we just deliver the material …".

Kutlo also mentioned that in addition he commonly used technology such as Blackboard, as well as a laptop for PowerPoint slides for f2f presentations. Kutlo also posted materials online through Blackboard but he said that f2f students did not access

[5] Names have been changed to protect the participants (see Appendix D)

these materials because they know and are aware that they could get handouts in class. In addition, PowerPoint slides were emailed to f2f students before class. This is what he said about technology use for teaching f2f students:

> The thing is, classrooms are equipped with this technology, the laptop. Every classroom has PowerPoint equipment so that you just bring your memory stick and insert it in the computer in the classroom. Now the only difference is that while the slides are being shown you also have to try to explain what appears on the slides to the f2f students.

Kutlo used technology to facilitate f2f classroom teaching but he used little technology with distance education learners. He said that distance education learners rarely communicated through email, or even cellphone, and telephone (landline) with him when studying on their own. He explained that distance education at the University of Botswana was not offered through online but is largely print-based with f2f classroom sessions. Kutlo referred to this as blended learning. In other words, learners are given print-based modules and f2f tutoring during residential sessions at the University of Botswana. Kutlo used some technologies in the f2f classroom with distance education learners. He said:

> I only use Blackboard as an online Learning Management System with distance education learners during their f2f residential sessions and their module as a guide. Tools such as discussion forums and chat are not used as a form of involving learners with the module to represent my presence similar to a classroom. I instead used PowerPoint slides when tutoring and presenting the module to distance education learners during the residential sessions on campus.

He noted that distance education learners often cannot access online materials posted on the Learning Management Systems such as Blackboard nor email due to a lack of technology infrastructure, but they are able to use computers and the internet when they attend their residential sessions at the University of Botswana. The time allocated to distance education learners during the residential sessions is limited. It does not allow them time to access materials posted online through Blackboard because learners were expected to have accessed materials before the session starts. During the distance learners' f2f residential sessions lecturers spend time going over work that distance learners should have completed but do not.

Although Kutlo generally supported the idea of using technology in teaching and learning, he added:

> … but my emphasis is that we put more emphasis on the examination rather than the learning, that is why students can miss classes but they know that if we have the material posted online through the Blackboard they can print the material and study it for the examinations. They don't mind missing the class as long as they can get the handout.

What Kutlo meant here is that with an exam-focused curriculum students can miss classes when materials are posted online or when they are given handouts, because they think they can read on their own to prepare for the examinations. In doing so, Kutlo said they miss f2f classroom learning opportunities where they can interact with the teacher and their peers for collaborative learning.

6.4.2 Itumeleng

Itumeleng has been a lecturer at the University of Botswana since 2001 and completed his PhD in 2010. He was promoted to a senior lecturer position and has been in that position for a year. He has taught XYZ 707 f2f since 2001 and XYZ 706 through distance education since 2005.

Itumeleng distributed print-based materials to both f2f students and distance education learners, such as course outlines, handouts, articles, and introduced prescribed books for the courses for students to buy from the university bookstore. He also referred f2f students to materials posted through an online Learning Management System such as Blackboard, and the course module for distance education. Like Kutlo, Itumeleng largely used teacher-centered approaches in teaching. During the f2f observations, f2f students were taught in a classroom, where some were attentively listening to Itumeleng's lecture and taking notes, while others were using their laptops for personal purposes. The students contributed to class discussions by responding to his questions and asking him questions. Itumeleng said that he lectures to them by providing information, but he allows them time to ask questions. The materials distributed to the f2f students guided them on the material covered in the courses in a semester. Again, like Kutlo, the most common use of technology in Itemeleng's classroom was PowerPoint, where he projected slides on the board and explained each slide to the students. He said that Learning Management Systems such as Blackboard were available and accessible to f2f students and he posted materials online, but students were not accessing the materials posted

online. He said he tried to persuade students by showing them how easy it could be for them to learn and have materials available at any time instead of waiting to attend a class. He observed that students do not access online materials when they know that handouts will be distributed during the classroom teaching. Itumeleng reported that he ultimately did not use online media because his students were not using it. Itumeleng noted that the non-accessibility of online materials by students compelled him to apply the lecture method in f2f classrooms, which was more teacher-centered. The teacher-centered approach enabled him to complete the course on time as expected by University of Botswana mandates.

Itumeleng felt that distance education learners needed to be "pushed" to do their work, which made it hard for him, as a lecturer, because he felt he was doing the work for the students. He stated:

> … level of drop outs in the distance mode sometimes you find its high compared to the level of drop outs in the f2f system, because students are not willing to learn. They need to be pushed sometimes and of course you are not there as a lecturer/tutor to be always sitting on their backs to say this is, and what they have to do. Then you find out immediately how far they have gone in getting to respond to the tasks you have given them. You find that in the majority of cases students just fill in the answers without thinking and then you do the work for them because you are expected to complete the course in a semester …

Itumeleng said that distance education learners at times communicated through email, telephone, and sent text messages when they were off campus. The other technology used by Itumeleng for distance education learners during the residential sessions on campus is PowerPoint, similar to f2f students in a classroom. It was reported

by Itumeleng that the majority of distance education learners were in remote rural areas, and when it comes to posting materials online for them it was impossible because they did not access them due to the lack of an internet connection. Itumeleng thought that even distance education learners in towns or cities did not access online materials even though they had an internet connection.

6.4.3 Mpho

Mpho has 10 years of university teaching experience and he completed a PhD degree in 2007. Mpho was promoted to senior lecturer and had one year in that position at the time of the interviews. He started teaching f2f in 2009 and through distance education in 2014. He taught XYZ 622 through f2f and the same XYZ 622 course through the distance education mode. Mpho has less experience in distance education than f2f teaching, with one and ten years' experience, respectively.

Mpho's response was that in his XYZ 622 course the f2f students are introduced to practical computer knowledge so that they can understand the tools and how to use them. The objective of the course was to make sure that f2f students could work with a computer, especially for doing assignments and writing reports. He said that normally he gave them theories or concepts and demonstrated to them in the classroom before going into the computer lab with them. For example, when he teaches Microsoft Excel he demonstrates how to do charts, describes what a spreadsheet is, how to do formulas, and

after that he does a little demonstration by writing on the classroom blackboard. That way, Mpho says, they understand. This is what Mpho said:

> So I come up with my own PowerPoint slides, then I deliver the slides. Then, after that, we do a simple small demonstration. Then, after that, I expect them to go to the lab to do what I did in the lecture through the classroom f2f approach.

During the classroom observations of XYZ 622 for f2f students, he carried his laptop to the class, inserted the memory stick and projected PowerPoint slides on the screen and explained the concepts and principles. He also wrote on the classroom whiteboard to further emphasize his points. Then, Mpho followed this with a demonstration in the computer lab, and the lab technician assisted with this when necessary. His teaching approach was the same for both f2f students and distance education learners when they attended residential sessions on campus. Although distance education learners have a module for XYZ 622, Mpho did not use it because he said it was outdated. Mpho said:

> With the f2f one, after that they go to the lab, then you ask them to do some exercises. Then, if they didn't get the principles right or concepts right you will see at the lab because I also attend the lab with them. The distance education ones are a bit of a problem in the sense that they don't have enough time, they have limited time, so the approach is kind of the same but you expect them to do a lot more outside class.

Mpho said that the Distance Education Department at the Centre for Continuing Education simplified the module for distance education learners. Mpho said he was not involved in developing the distance education module. In addition, the main challenge

for distance education learners, according to Mpho, was that they did not have access to computers. Most distance learners lived in remote rural areas and it was only when they attended residential sessions at the University of Botswana that they were able to access computers. Mpho emphasized a student-centered method of teaching. He said:

> … I give them information during these sessions. It should enable them to do more on their own. You are just teaching them but at the same time you are empowering them, … and in the case of distance education learners they have the workbook. We don't necessarily follow the workbook, as I give them the background information.

During the f2f classroom observations, similar materials were distributed to both f2f students and distance education learners. The difference in teaching distance education learners compared to f2f students, Mpho noted, was to adjust f2f-teaching approaches so that distance education learners could learn on their own. The time for distance education learners is limited during the residential sessions, so there is little time to go over the materials with them. Mpho had to adjust the content he used for f2f students when teaching distance education learners. Adjusting meant providing them with more materials, additional simplified handouts, and less lecturing.

Mpho also mentioned that online tools (WebCT) were used at times for f2f students but not distance education learners. PowerPoint slides were made available online to f2f students to access on their own and were posted through WebCT. Notes in the form of handouts were also distributed to the f2f students. It was noted by Mpho that

distance education learners were not able to access online materials due to lack of technology infrastructure in remote areas.

6.4.4 Keitumetse

Keitumetse has been a lecturer since 2010 at the University of Botswana. He had been a lecturer for two and half years in 2014 at the time I was conducting interviews, although he started as a temporary lecturer in 2010. Keitumetse completed a master's degree in 2003 and he has been pursuing a PhD program since 2013 on a part-time basis. Keitumetse started teaching f2f in 2010 and distance education in 2011. He taught XYZ 603, XYZ 705 f2f and the same XYZ 603 course through distance education.

Before joining the University of Botswana, Keitumetse worked for 31 years in the government as an extension officer, starting from the grassroots level and achieving a high rank. He felt that he had acquired a wealth of experience in community work on rural development. He applied these experiences in his teachings at the University of Botswana, and thought it was worthwhile to give students' real life experiences and examples. Keitumetse said that the course he taught in adult education was a practical course where students learn how to work with other adults, and how to mobilize by engaging them in programs or projects that could help them improve their lives.

Keitumetse explained that he used various teaching methods to facilitate students' learning and understanding of the lessons taught, such as PowerPoint slides, where he explained the slides as they were projected on the screen in the classroom. The other method he used was collegial or group learning, where students prepared for class presentations using PowerPoint slides in a group on a similar topic of research. He also invited speakers to present their experiences in the field based on the course topic so that students could learn from their experiences. Keitumetse predominantly used PowerPoint as a lecturing method to present notes to f2f students, and promoted collegial relationships in class through discussions. He also grouped students together to present assigned work and to share with others what they had done. Keitumetse liked teaching and he said:

> So normally I find I enjoy teaching because I teach courses that are relevant to my experience in the field and I find it very easy. When I read books I am able to reflect on the real world, and on the experiences that I encounter in the field and I enjoy it.

Keitumetse used Blackboard to post learning materials online to be accessed by f2f students before class. Keitumetse used his f2f teaching method with distance education learners during their residential sessions, though he noted that he could not use technology when working with distance education learners because the majority of them were in remote rural areas where network connections were lacking. That said, those in towns and cities closer to computers at their workplaces and other employees of the University of Botswana also did not access online materials.

6.4.5 Oratile

Oratile said that before pursuing a master's degree in early 1993 he had been teaching a distance education program. Oratile said he taught the two courses in the early 1990s and then pursued a master's degree overseas. Oratile continued to teach as a lecturer on his return from overseas with a master's degree. He later pursued his doctoral degree abroad, after which he continued working in the same department and was promoted to the Head of Department and became a full professor in his area of expertise (see Table 6.1). Oratile described how he taught distance education courses:

> … so essentially it was a self-taught kind of thing. To teach the students, we were told the venue was at Tlokweng in the teachers' college not far from the University of Botswana, so we would just go there and basically do essential preparations to meet with them and they would have been given the reading materials ahead of time, so I would also prepare them and just do some discussions, facilitate some, introduce the concepts and exchange with them regarding how they should do the content versus their own personal experience.

Oratile meant that distance education learners teach themselves through the module and with materials provided to them in advance. Therefore, when he met them during the residential sessions, which were held at the teachers' college in Tlokweng not far from the University of Botswana, he involved them in a discussion to find out what they had learned from the module. Oratile emphasized that he facilitated the process of involving them in the discussion.

Oratile currently teaches both f2f and distance education when distance learners attend the residential sessions. He said that distance education learners have limited time and when he meets them he has to make sure they complete the module because they are on their own after the residential session ends. Oratile stated:

> … so I would introduce them to the first seven units in a module and you know basically you talk to them about the key concepts in each of the chapters or units in a module and then send them out to go and do their own independent reading and then they have to submit an assignment…

Oratile said that he distributed course outlines ahead of time to the f2f students before class and also sent a module to the distance education learners. The f2f students and even the distance education learners were expected to read the assigned readings before class and also complete assignments if stated, to prepare for class discussions, and he describes how: "… we basically would prepare the course outline ahead of time". He then met them in class and described important concepts to them and in return expected them to have read the materials so they could contribute to class discussions.

The only telecommunications media and technology he used with distance education learners were landline telephone and cellphone text messages, respectively, when the need arose. He said that email for distance education learners was not used in the early years although it is currently used more, and is used for f2f students and distance education learners when they attended the residential sessions. Oratile said that for f2f courses, Blackboard was used, particularly the discussion tool. He posted learning materials online through Blackboard for students to access at their own time. He reports:

> … in terms of technology for the f2f students they also take advantage of the fact that they are here they use the labs, so they are expected to do a lot of work online on the Blackboard discussions, … we email them and so constantly we are continuously engaging them through online discussions. But unfortunately these students do not use and access online materials posted as expected. There are some who do try to access but not at our expectation. At the end of the day as a lecturer I found that when they come to the f2f classes they do not reflect on previous online materials posted to them.

In another example, Oratile used a SMART Board for his graduate f2f master's students' presentations, and although the electricity cut off during his session that day the class still continued, but when it became too dark in the classroom, the class ended and was continued in the next session. Oratile was able to integrate the SMART Board and other technology during teaching and learning, including Blackboard, performing Google searches during the lesson to clarify or emphasize a point, and PowerPoint slides.

6.4.6 Lesego

Lesego is currently a professor. Her approach to teaching is that, "the best way to learn is hands on". Lesego's philosophy in teaching is that "to get it you have to practice it", meaning that teaching involves 50% theory and 50% practice. Lesego expected her students to go and see what was out there in the real world, and discuss theoretical problems, not perceived problems. This teaching philosophy was applied to both methods of teaching, f2f and distance education. She taught different courses, including XYZ 712 f2f and XYZ 720 through the distance education mode.

The learners were given reading materials in advance for both f2f and distance education course outlines and modules, as listed in Table 6.3. She discussed the materials in class with them f2f and expected responses from them. Lesego reports:

> …If I find that it looks like some people are not getting it and it's kind of difficult, then we break into groups, … and then I give them a thematic area and have them deal with it as a group. … they also have the opportunity to now impart their understanding of some aspects of the material to the rest of us in a f2f class, and for another group it is also the same, … why do I do this? … my assignments are application, practical also, right, so it's really basically exposing them on how to do it because for them to do the assignment, individual assignments, they still have to go and interact with other groups of people, so I'm hoping that's how it works.

According to Lesego, she distributed print materials used by f2f students to distance learners to supplement the module because they cannot access the internet when they are at home in remote areas. She did this because distance education learners' main print material is the module, which is meant to be self-explanatory for independent study. Therefore, she provided them with additional material to assist them, she felt, when they learn independently. Distance education learners also use cellphone, landline telephone, and/or email, if available, to contact her for assistance. Lesego felt that it was better and easier when students were provided with additional materials because explanations over the cellphone or telephone were too short and did not cover all areas in need of clarification for either the lecturer or students. Face-to-face students have more access to resources like meeting with the lecturer on a daily basis and even having access to the internet and computers on the university campus. Distance education learners access technology and also use internet when they attend residential sessions at the University of

Botswana unless their workplaces have internet and allow them to access and use it. Lesego also mentioned that the other challenge faced by distance education learners was electricity outages. Electricity in rural areas was not consistent, and even in places with electricity it was not always consistent. This also happened in certain cities, like Gaborone. Thus, distance education learners were faced with challenges relating to lack of ability to access online materials. Lesego said:

> Yes, I have limited experience in technology, because we don't use it here. So what I would really want, my number one thing is that this transition is very important, and we should be moving slowly towards online programs. This is an international thing. If we are going to be an excellent university we cannot do without online. But unfortunately we don't have the capacity, and lecturers like myself don't have the capacity to be able to use online programs, ….

Lesego used Blackboard for her f2f students. She posted materials through the content delivery forum on the Blackboard, such as handouts, specific websites, and the titles of specific books students could access from the library. Lesego found that the students did not access online materials but rather used the print materials that were distributed in class. She said:

> Face-to-face students are making my life so hard because whenever I post materials for them online through Blackboard to read before class, they don't and in class they fail to contribute and rather prefer me to provide them with information.

Lesego also mentioned that distance education learners cannot access any form of online materials due to lack of infrastructure. She said that at times she communicated

with distance education learners through cellphone and telephone because they were common forms of technology and telecommunications media, respectively, used by all.

6.4.7 Serero

Serero became a senior lecturer in 1991 and completed her PhD degree some years later. She has been teaching since 2010 both through f2f and distance education. She currently teaches XYZ 804 f2f and XYZ 711 by distance mode.

Face-to-face students were mainly grouped into large classes, which was a problem when teaching alone, said Serero. Large classes made it very difficult to assist students on an individual basis. According to Serero, although f2f students could make an appointment to see her individually, she felt that it was still difficult because it was not feasible for 200 students to come to her office for assistance.

During the observations, Serero lectured to f2f students and provided them with materials such as course outlines and notes, and referred them to articles on the internet. She reported that she was fearful of technology, but did use some technology in the classroom. She usually projects PowerPoint slides on the board and explains concepts using the slides. Serero emphasized that she tended not to use a lot of online technology because she was not comfortable using it.

During the residential sessions, Serero used the same teaching method for f2f students with distance education learners. At times she felt sympathetic and telephoned the distance education learners when she had not heard from them, unlike the regular f2f students who, she felt, were assisted all the time because they were on campus.

Serero applied the University of South Africa's method of preparing materials for distance education learners. She felt that the University of Botswana's distance education program is not well organized or planned compared to the University of South Africa's. The University of South Africa patterned their tutorials, assignments, and study exercises through a study guide, which was different from the University of Botswana distance education learners' use of a module. The University of Botswana distance education learners are taught based on the module, not a study guide like the University of South Africa's learners, so in addition to the module developed in house by the University of Botswana lecturers, the South African study guide was also used and Serero provided the distance learners with additional copies of materials.

Serero mentioned that distance education learners attended residential sessions twice in a semester. In the first session, they were expected to have completed the first seven units on their own and the remaining seven units were to be completed before the second session at the end of the semester. With a 14-unit module, Serero assigned distance education learners to write a one-page summary of each of the seven units on their own. If she found that the learners did not understand the material, she arranged a separate time outside of class hours to assist them. Serero said that she also assisted

distance education learners when they needed assistance at their individual places through either Blackberry text messaging or WhatsApp Messenger (a free text messaging service).

Serero used technology like computers (laptops) and the internet but she said she fears them. Although she advised distance education learners to use Blackboard messaging from their cellphones or to use WhatsApp to send messages to her, she said technology intimidated her, and that she lacked the skills needed for online teaching. But she was comfortable using her cellphone for sending text messages, and using landline to contact students. Serero said that distance education learners did not have access to electronic media in remote and rural areas. She did not use a specific online technology for distance education learners such as Blackboard, because she said students never used these technologies to access materials posted online, even though distance education learners are able to access the internet during residential sessions on campus. Serero was not conversant with online media such as Blackboard, although it was used in the University of Botswana systems and some lecturers had been trained to use it. She had attended some training offered by the Center for Academic Development on the use of technology but she did not attend the training offered on Blackboard and had to learn the skills on her own. She acknowledged, however, that there was support from the Center for Academic Development to learn online technologies:

> ... we were once taken by the Centre for Academic Development to be shown around how the system works but some lecturers and professors knew how it works, and one of the professors even arranged the workshop and one newly hired lecturer has attended all these courses so he knows a little bit better than the rest of

> us, we don't know how to use it, and we only saw it when we were at that workshop.

6.4.8 Mmapula

Mmapula has been a lecturer since 2005, and has a master's degree. She had been teaching f2f and distance education since 2005. She currently teaches XYZ 717 in the classroom and XYZ 712 through distance education mode.

Mmapula said that she was of the 'old school'. Most of the time she taught f2f and used technology that was compatible with her teaching environment like PowerPoint slides. She felt that f2f teaching allowed more personal interaction. Students were more attentive because they took notes themselves. She also used the internet on her laptop computer. She commented that using PowerPoint slides projected on the screen in a classroom has an advantage over print because it is clearer. The disadvantage is that students end up not taking notes and request a handout at the end of a class. She said:

> Yes, when I use PowerPoint slides, they tend to concentrate more on the slides and they do not take notes and also do not participate in class discussions. The class discussions are to give them an opportunity to share in class what they know with others. This enables them to share their practical experiences relating them to the course. The students at the end of the lesson expect me to give them PowerPoint slides as a handout, yet they were posted online for them to access. So, even if you give them the copy of the slides as a handout it does not mean that they will remember what was said in class because slides are in point form (focus on key points). So, I like the f2f way of doing it even though students' participation in f2f classroom session was low.

She also said that she used the same material for both f2f students and distance education learners. The difference was the preparation for the different needs of student types. She said there were more mature adults in distance education learning and younger students in f2f classrooms. She provided more information through handouts to distance education learners as compared to the f2f students. She argued that their level of understanding was lower, and that f2f students were better off because they were high school completers, while distance education learners had often only completed primary school (standard seven and secondary junior certificate). Mmapula said that distance education learners were mostly those who could not make it to the university programs and needed assistance based on their prior learning experiences.

Mmapula, similar to Keitumetse's approaches, used discussions, the PowerPoint presentation method, and invited speakers from other organizations relevant to the course to explain real world experiences. Students also were sent out to some organizations for experiential learning. Her most common method of teaching was supplementing lectures with presentations, discussions, and guest speakers for both f2f students and distance education learners during residential sessions.

Mmapula said that there is limited time to teach distance education learners because they come only for one week to attend residential sessions. She argued that the materials for distance education learners should be planned and managed within that timeframe. Normally, they only covered half of the modules (7 from 14 units) because learners were expected to have read them in advance but rarely did. Then, these materials

were supplemented in class with PowerPoint slides, handouts, and class exercises. She said that distance education learners are mature workers and learners and could easily relate their readings to experiences they had and that distance education learners had plenty of work experience despite their low level of education. She said, however, that they had problems with learning in English. This was a common issue even among f2f students. Mmapula said that she simplified the module for distance education learners by summarizing content in the form of a handout and distributing it during residential sessions on campus to complement the module. She said that it was good to use technology in class. Class notes could be uploaded onto Blackboard and then students could access them from a computer lab.

6.4.9 Lorato

Lorato had been in a lecturer's position for six years. She had completed a master's degree. Lorato taught XYZ 612 through f2f since 2008 and the same course through distance education since 2004 at the University of Botswana.

Lorato's philosophy of teaching was that students are not empty. She said, teaching is like "lighting a candle"; although they might be struggling here and there, they are not empty vessels, which needed some information poured into them. She identified the "problem" as the inability to grasp concepts and problems in English. Lorato tried to provide distance education learners with what they needed within the limited time and

without overloading them with information. She said that the university did not support lecturers on how to deliver distance education courses. Instead, she used her previous teaching experiences acquired from secondary schools and colleges of education in Botswana. Lorato said: "I regard myself as a teacher because a teacher gives students information. We spoon feed them rather than lecture. I provide them with more information to supplement their learning". What she meant by "spoon feeding" was that lecturers really provide help and support for students because students often do not complete assigned work before the class starts.

Lorato said that she blended the f2f method of teaching with technology. Course information was posted online through Blackboard. She also tried using a module posted online through Blackboard to be accessed online by distance education learners and was not successful because internet connections were intermittent. She said that distance education learners were often not familiar with Facebook and their cellphones were not often connected to the internet due to high costs.

As a result, Lorato felt she had a difficult time interacting with distance education learners when they were in remote areas. They come for residential sessions for a limited time and were taught for four to six (4-6) hours a day. Lorato felt that since the time allocated for distance education residential sessions was limited, she applied her f2f method to teach the distance education learners. When they were off campus distance education learners used text messaging to communicate with her but she did not respond

because she said text messaging took a lot of time and it was difficult to give long explanations.

Lorato reported that f2f students had access to WebCT and she posted materials for them online. She informed the f2f students about the materials posted online, and asked them to access and read them before coming to class. Lorato accessed WebCT analytics to check whether f2f students had logged in and read materials posted online, and for how long. She said that students did not use the materials on WebCT, even though they were told to beforehand. She relied on providing students with handouts and prescribed textbooks to supplement f2f lecturers. She also used PowerPoint, and YouTube videos in f2f teaching. Lorato was the first person to try using WebCT at the University of Botswana. When the University of Botswana introduced Blackboard, and then Moodle, she used it with the f2f students and she loved it, although she once again acknowledged that the students failed to use it. Lorato also posted materials for students on Facebook and expected students to respond, which was not successful.

6.5 Discussions of Profiles

Three themes occur across the participant data: the use of teacher-centered methods, the use of technology in f2f, and the low use of technology in distance education.

6.5.1 Teacher-Centered Method

Although many participants incorporated some student-centered activities as observed in the profiles above, the predominant teaching method in f2f classrooms was lecturing using PowerPoint slides. Participants generally used PowerPoint presentations because it was compatible with their teaching experiences. During the observations, lecturers generally provided information to students and did mostly talking in f2f teachings. Reflecting on why participants continued to use teacher-centered learning despite understanding and wanting to teach student-centered classes, two issues were noted: (1) they experienced pressure from the system, and (2) they tried to incorporate innovative practices with teaching.

Pressure from the System: Participants identified that their teaching methods were focused primarily on examinations. The University of Botswana expects lecturers to complete the syllabus by the end of every semester. Lecturers tend to concentrate on the exams and use a teacher-centered approach because they are able to deliver material quickly. Student-centered approaches, they felt, took time they did not have. Some participants tried to move away from teacher-centered teaching. Oratile, Lorato, Mpho, Lesego, and Mmapula used more of a student-centered approach compared to the other participants. They gave students activities that engaged them in learning for discovery or inquiry (for example, group presentations, class discussions, researching on a topic from the library/internet).

Participants attributed the use of teaching-centered approaches to pressure from the university administration or, in Rogers's terms, the social system. Lecturers tended to concentrate on completing the syllabus rather than on students understanding the concepts or being able to learn through activities. Consequently, the lecturers developed teaching methods and materials around examination questions and covering the syllabus. These materials were developed into handouts and used to guide the students towards the end of the course. As a result, students tended to rely on the lecturers giving them information. Many participants mentioned the pressure from above but also the lack of participation by students.

Innovative Practices with Teaching: Participants, however, did try to incorporate many innovative practices. Some incorporated experiential learning, others provided demonstrations and many included group work. Many of the participants obviously enjoyed teaching and had considerable education and experience in teaching. They all knew and understood the difference between teacher-centered and learner-centered approaches.

6.5.2 Use of Technology

Despite the low levels of technology use, all nine participants were early adopters of technology in that they used various types of technology and they used what was available to them in novel ways. They engaged with Learning Management Systems

where they could, and some used social media. Many used cellphones to connect to students and to distribute links to materials. Again here, participants experienced pressure from the administration in that they did not have enough time to learn how to use the technologies available and were just doing what they could, teaching with PowerPoint. When they did try to incorporate technology provided by the university into their teaching, they found little uptake on the part of students. In sum, there were many challenges in the technology diffusion process.

Various types of technologies were used for teaching and learning. Of all the technologies used, which are noted in Table 6.1 and 6.4, some participants used technology more than the others. For instance, Oratile and Lorato were the most frequent users. They engaged innovativeness by experimenting with online technologies where they posted materials through Blackboard and other Learning Management systems. Participants like Kutlo, Lesego, Serero, Oratile, and Itumeleng used landline telephone and cellphone to contact students, especially distance education learners, even though this was not standard practice. The University of Botswana offered training on Learning Management Systems like Blackboard, Web 2.0, and social media such as Facebook, YouTube, and participants voluntarily attended the workshops. Workshops were offered whenever a new technology was introduced. However, participants felt that the time devoted to training was not enough and with the emphasis on exams, there was even less time to implement these technologies into teaching and learning.

Although they all used new technologies, more or less, for teaching and learning, participants tended to rely on the technologies that were most compatible to their day-to-day teaching experiences. The technology most often used was PowerPoint, since it was easy to implement, it enabled them to meet the requirements of the university schedule and it suited the students. These views on compatibility resonate well with Rogers' (2003) idea that when a perceived attribute such as compatibility is high, the adoption and diffusion of technology rate is also high. However, even though compatibility with PowerPoint was high, this differed among participants, and as noted above some used this more than others. Despite the low levels of online technology use, given the university's priority to migrate to online learning, a surprising finding from this data is how much online technology was used in f2f classrooms.

6.5.3 Distance Education and Technology

It is clear from this data that very little, if any, technology was used for distance education. Distance education has remained print-based with residential f2f sessions. The residential sessions consisted of a week, early in the term, where students collected material and a week at the end of the term. Although students were supposed to learn independently during the term, this often did not happen. Distance learners, as participants indicated, were often students who had not completed high school and consequently experienced difficulties studying. Many also struggled with low levels of English proficiency. In addition, the lack of connectivity in rural areas, where most of the

distance students came from, was an added reason why so little technology was used. Distance education learners are usually located in rural remote and poorer areas where there is lack of infrastructure. The rural remote areas are mostly not connected and if connected there are often problems with electricity. Where connectivity was available, dial-up methods were used at great expense. Since the majority of the distance learners were adults who worked part-time or were unemployed, it was impossible for them to access the technologies, even when they were available. These challenges do not create a technology culture. During the distance education learners' residential sessions, many come to the class without completing their assigned work. While in residence at the University of Botswana, participants found that they had to teach distance learners the whole syllabus in one week because they were not learning on their own. Also, even with the availability of technology at the university, distance learners did not use this technology during their residential periods. This is not surprising, since they would have had little experience using technology at all.

6.6 Conclusions

This chapter reports on the demographic information and artifacts used for teaching and learning. Participant profiles were developed and discussed in relation to a number of themes. All participants were experienced lecturers and early adopters of technology despite the low levels of technology use. A clear narrative that emerged from the participants was that students do not use technology and this is what caused them to abandon the technologies, particularly, the Learning Management Systems. But there

were also other pressures. For example, there was little time for technology training or for incorporating technology systematically into teaching and learning. With packed syllabi and little time to cover course materials adequately, participants resorted to what worked best – PowerPoint presentations and teacher-centered teaching. Even though the university provided a range of technologies and regular training on these technologies, participants felt they could not accommodate these new technologies into the daily teaching without substantial stress. Furthermore, online technologies for distance learners were non-existent because of a lack of infrastructure and the characteristics of distance learners. Participants felt that online learning was not possible given all these contextual issues. A surprising result from the data was, however, how much technology was being used in the f2f class considering the range of problems associated with technology.

CHAPTER 7 – RESULTS: PARTICIPANTS' RESPONSES TO RESEARCH QUESTIONS

7.1 Introduction

The purpose of this chapter is to discuss participants' perceptions about moving to online learning and to analyze participants' responses to the research questions to further enable an understanding of the transition process. Two research questions were developed based on the primary question. Responses from participants were coded in line with three of Rogers' (2003) concepts (compatibility of technology, social systems, and early adopters), focusing on the use of technology innovation in the transition process. The first question was "what are the characteristics, knowledge, skills, and beliefs of early technology adopters?" Participants described themselves and their teaching at the University of Botswana (compiled in the participant profiles) as well as their thoughts about what was needed for the implementation of online learning. The second question was "what are the challenges in the transition process?" These questions allowed participants to share their knowledge and thoughts, and give comments, suggestions, or recommendations on their experiences of technology in the transition process. From these general responses the emotions of the participants was identified as a key theme. This chapter is structured by using the two questions to organize participant responses, followed by a discussion of participant emotions.

7.2 What Are The Characteristics, Knowledge, Skills, And Beliefs of Early Technology Adopters

This section examines the characteristics, knowledge, skills and beliefs separately. Drawing on Rogers (2003), participants' responses will be contextualized within this diffusion of technology theory.

7.2.1 Characteristics

In this section, Rogers' (2003) views on the characteristics of early adopters were used to understand how participants related to technology. Four aspects of Roger's characteristics were found: innovativeness, localites or interpersonal networks, leadership roles, and the concept of change agents. Each of these will be discussed below.

Innovativeness: According to Rogers, "Innovativeness is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system" (p. 22). Adopters are classified into two groups of early adopters: 1) innovators and early adopters and 2) three groups of late adopters: early majority, late majority, and laggards. The participants in this study were categorized as early adopters in adopting and diffusing innovative technology because of their innovativeness at the University of Botswana. I selected them because of their involvement in online learning technologies. However, it soon became clear that 'early adopter' means something very different in this context. In a context like Botswana

where there is little technology in the everyday lives of people (little email, few laptop computers, limited, if any, online courses), the role and characteristics of early adopters is different to that of the North American context where technology is saturated in the environment and widely used. For participants' in this study, faced with these major obstacles, deciding to learn a Learning Management Systems, for example, is innovation. Participants reported that they attended training offered to them on how and why to use technology in teaching and learning. This showed that they were early adopters because the expectation was for them to migrate to online learning. Generally, participants used some online technologies in teaching and learning even though they felt they were not given enough time to learn and practice using it. Generally, the participants felt that the university in transitioning to online technologies did not support them, but they still went out of their way to use technologies and to apply the knowledge and skills they received through the Centre for Academic Development on how to use these technologies. According to Rogers, the innovativeness of early adopters increases the rate of technology innovation adoption and diffusion in the system. As it is in this study, the participants who used technology before such as Oratile, Lorato, and Mpho had a higher degree of innovativeness than those who started more recently like Serero, and Mmapula.

Rogers argues that successful innovators generate the curve over time from early adopters to late adopters; therefore, individuals in a system are adopters at different rates. For instance, participants in this study as members in the social system were relatively stable in innovativeness and were willing to change their comfortable practices in teaching through the use of technology innovation. Therefore, in line with Rogers'

(2003) views on categorizing and classifying adopters of technology as innovative, leaders, mentors, advisers, and localites, participants' responses resonate with these concepts. For example, Lorato commented:

> I love the new technology. I am one of the first lecturers here who tried using Learning Management Systems such as WebCT and Blackboard. I tried to use Facebook also with the face-to-face students last academic year and I loved it. The reason why I halted was because that is my line of study really. I wanted to access, evaluate, and see what it is that makes the students not to go into the online course the way they should. It is my line of study because it worries me that we have this technology, which I was excited about and thought the students also will be excited about but it seems they were not.

Keitumetse reported on how he made himself acquainted with the University of Botswana's expectations. He said:

> I make sure that I acquaint myself with what the university expects from the lecturers and how it should be done. So I attended through Centre for Academic Development around fifteen short courses on teaching and also tried to use the information technology system to make sure that I do what is done and expected from a lecturer in the university, like the PowerPoint, like Moodles, to make sure that you know I can use even the videos and everything if and when necessary.

Mmapula said: "Although the f2f teaching schedules and personal weekend times clash with the training sessions offered through Centre for Academic Development for lecturers, I tried to create time and attend some of the sessions".

However, some participants', like Serero and Mmapula, did not enjoy using online technologies, like Learning Management Systems, in teaching but still used cellphones as a way of contacting students and contacted peers for assistance which again shows some

level of innovation. Serero said: "I felt for distance education learners and I contacted them through telephone, SMS [text messages] to check if they needed assistance and asked Keitumtse to show me how to use some tools from the Blackboard".

The participant responses show that although the innovations and use of online technology was small, they were innovative within the constraining circumstances they found themselves in. They did participate in the diffusion of technology in the system, even though it was to a small extent. For example, Lorato was the first lecturer to use a Learning Management System and to help others with this technology. She also evaluated, on her own, to find out why f2f students were not accessing materials posted online. In addition, although she had never been trained to use Facebook in teaching and learning, Lorato did use this online technology. Similarly, Keitumetse acquainted himself with these technologies by attending many training workshops offered by the Centre for Academic Development despite a heavy teaching load. While this may not seem like innovation, within this context, showing an interest and attending training constitutes adopter characteristics. While the extent of innovation may not equate to the interpretations of Rogers in other contexts, within this constraining context, the participants still showed a level of innovativeness. Learning how to use a Learning Management System or contacting students via cell phone is evidence of overcoming inertia and being actively agentive in a context where technology is foreign and unknown. These examples all show adopter characteristics and an underlying belief in the value of online technology and that is what makes them innovators.

Localites – Interpersonal Networks: According to Rogers (1995), early adopters are characterized as localites, as opposed to cosmopolites. Cosmopolites communicate through mass media but localites communicate locally within a social system through interpersonal communication channels. Localites communicate with peers, are role models, and are opinion leaders who advise potential adopters about innovation. They are also respected by peers and can make intelligent decisions on the adoption and diffusion of technology (Rogers, 1995). Rogers argues that, "Early adopters are a more integrated part of the local social system than are innovators …" (p. 283). In other words, early adopters are more influential at the local level within the social system. Localites are influential at the local level by communicating through interpersonal networks on the same level with other peers. This characteristic is true for participants in this study. Participants shared experiences and helped each other at the peer local level. Those with more experience using online technologies helped others and shared resources, thus helping to diffuse the technology. For instance, Mmapula said that she is of the old school but she values and knows that technology is valuable for teaching and learning and commented that:

> I have limited time to attend the workshops offered to us by the Center for Academic Development on how to use Learning Management Systems in teaching. I find it hard to follow because they are very fast when explaining and I am not used to using computer most often for teaching. So, after these workshops, I ask for help from other lecturers with more experience. I asked Keitumetse how I can use for instance the discussion chat with my students, one of the Blackboard tools.

Lorato being more experienced in use of technology advised his peers on how to post materials online and check if student had accessed them, she said to Serero when she came for help:

> First you access the Blackboard, but make sure you have the names and emails of all your students because you are going to add that information in the system: Blackboard. Then you must also have the materials you want to send to them prepared well and clear in advance because you are going to add all the materials you want them to have before they come for class. Once you have added all this information, then this is where you add each type of information because Blackboard has different section/sides for each type of information …

Leadership Roles: Rogers (2003) argues that when early adopters are role models their attitude toward innovation is highly important. He said that, "early adopters put their stamp of the approval on a new idea by adopting it" (p. 283). In this way, early adopters play a leadership role in aiding the diffusion of technology. Many of the participants in this study were role models with their positive attitudes toward technology innovation. Again here, the amount of leadership is small, given the lack of technology use overall. However, many participants for instance Kutlo, Oratile, and Lorato posted the materials online for students to access before they attend the f2f class. These lecturers were enthusiastic about using WebCT, Moodle or Blackboard and shared this enthusiasm with others at the university. Even within the sample group, participants encouraged and stimulated others. Rogers (1995) said that early adopters are confident and efficacious risk takers with technology innovation. He further said that they are:

> … the 'heart of the diffusion process' which consists of interpersonal network exchanges and social modeling between those individuals who have already

> adopted an innovation and those who are then influenced to do so. Diffusion is fundamentally a social process (p. 34).

This social process was evident among participants and several participants could be described as "confident and efficacious risk takers". Obviously not all the participants can be described as such, for example, Serero and Mmapula, but on the whole, in this context of such little technology use, these participants stood out as leaders. For instance, Serero commented: "Please feel free to contact me through telephone or cellphone or text messaging, I am here to assist you in whatever problem you have and wherever you are, please." Overall, participants were opinion leaders, which has helped, in a small way, to diffuse the technology through the system. On the other hand, Mmapula commented, "I advised the students to use the technology by assessing materials sent to them online and learn from the internet to get a broader better understanding of concepts". The early adopters in this study were not performing this role without constraints. The diffusion process generally was constrained by the university administration and the context of poor infrastructure.

From Rogers' perspective, early adopters hold leadership roles and act as leaders and others come to them for advice or information about innovation. Roger's argues that true innovators play a central role in every stage of the innovation process, from the initiation to the implementation stage. In this study, however, participants felt they were not involved in the initiation stages and also that their leadership role was not recognized in the system. They were only involved in the implementation stage where they could not

influence some of the decisions that had already been made. These points surfaced many times throughout the study.

Change Agents: Rogers (1995) argued that a change agent is an individual who influences potential adopters in a direction that requires substantial change. Therefore, early adopters as opinion leaders make changes as "local evangelists", (Jacobsen, 1998, p.18) and "missionaries" (Rogers 1962, p. 249) to speed up the diffusion process. Again, while the participants in this study may not be change agents on the level of those in technology rich contexts, some tended to act as change agents. Change agents tend to lead the diffusion process by influencing others, especially potential late adopters. For example, Lorato's act of exploring why students were not using materials posted online was done to help other lecturers and to encourage more use of online technologies. Serero and Mmapula, the two participants who had the least amount of innovation where technology was concerned still contacted others like Keitumetse to learn and practice use of technology.

In addition, all lecturers posted materials online in their f2f classes as a way of influencing students to access and use online materials. Although Rogers views the organization as the main change agent, he also expects the early adopters to influence late adopters by being change agents. The broader literature concurs with the fact that a change agent is any individual who influences and makes changes in the organization (Ellsworth, 2000; Hall and Hord, 2014). In this study, participants felt they were expected to make changes through technology, which they did at a local level, but they

could not act as "missionary" change agents (Rogers 1962, p. 249) because they felt that the university environment had too many obstacles to the diffusion of online technologies. Their influence as change agents was relatively small as a result. The university did not allow them time to really learn and or to practice using this technology, enough to be effective change agents within the system.

7.2.2 Knowledge of Technology

Rogers (2003) argues that individuals make decisions to either accept or reject an innovation technology by "seeking and processing information in the system and this motivates them by reducing uncertainty about the advantages and disadvantages of an innovation" (p. 172). The knowledge stage is the point at which the individual seeks information and processes it in an attempt to determine "what the innovation is and how and why it works" (Rogers, 2003, p. 21). He said there were three types of knowledge: awareness-knowledge, how-to-knowledge, and principles-knowledge. Rogers said that it is at this knowledge stage that individuals become aware of an innovation, and learn its functioning principles on how and why it works.

The participants in this study were made aware of the technology innovation used by the University of Botswana because they were offered free professional development and training through the Centre for Academic Development on the current eLearning technologies. These changed over time from WebCT to Blackboard to Moodle.

Sometimes these Learning Management Systems existed concurrently. Training focused on the components of the Learning Management Systems and how they could be used in teaching adult education courses and programs. Additional training was offered on using social media (Facebook, the internet, etc.) in teaching as well as using PowerPoint for in-class as well as conference presentations. Participants generally showed awareness of awareness-knowledge, how-to-knowledge, and principles-knowledge. They all took part in regular professional development and training offered to them by the university. Some gained knowledge from peers, by attending seminars, conferences, and workshops outside of the training offered. These lecturers were aware of how to use the technologies as well as the policies laid down by the system in which they operated. Learning from peers, and other sources, is an indication of a willingness to understand and use technology outside professional development provided by the system. One participant, Lorato had reported that they often used their private time to gain further knowledge about the innovation. For some of them this was seen as an infringement of personal time. Even professional development was often conducted during personal time. Seminars, workshops and training often took place during university holidays and weekends.

Therefore, it is fair to say that the participants in this study had adequate knowledge of the technologies being diffused. This knowledge was not equal among participants. Not all participants had enough knowledge they felt, to teach the adult education courses using online technologies. Although technology was used in face-to-face classes and in distance education residential classes, some claimed that they did not have enough knowledge on how to teach distance education at the University of

Botswana via online technologies. The participants generally said that online learning was not easy for them. The participants said they needed more knowledge on the use of technology in pedagogies because f2f students and distance education learners did not access online materials. Lesego's comment below indicates the extent of her knowledge but also the gaps:

> We as lecturers are trained abroad, so I have everything in my computer that I need to use. But the thing is there is no lab for distance education learners or where they are they don't have access to the computer, even if I wanted to send them something through the internet (online through the web), and if I wanted to interact with them, I can't do it.

Another participant, Lorato, emphasizes the gaps in her knowledge:

> I started off as a secondary school teacher before joining the academic lecturing field in the University of Botswana. I taught in junior, senior schools, and colleges of Education. Currently I am specializing in English Language and had never used technology for teaching and learning. But I am expected to use the technology with limited professional development and training offered to us as lecturers. I do not have enough time to learn and practice using technology for f2f and distance education. Because I believe that use of technology has an advantage, so therefore, I tried my level best to use it in pedagogies and get some help from peers.

The participants' knowledge varied, some were content experts in the field of adult education teaching or in their area of specialization, but not all were experienced and knowledgeable in technology. Although some they had been sent abroad for training and most received training through short-term courses at the University of Botswana on how to use technology for teaching and learning, they certainly were not experts in all areas of technology, teaching, and content.

As Lesego noted:

> We need people who have the know-how and experience in distance education and also who are capable to deliver online because they know what to do, they know how to handle students and I am saying because with my experience and my training is not sufficient. So the University of Botswana is still very far, meaning still behind on online learning.

In line with Rogers' (1995, 2003) views, and the results found in this study, Seeman (2003), cited in Sahin (2006), argues that, "To create new knowledge, technology education and practice should provide not only a how-to experience but also a know-why experience. In fact, an individual may have all the necessary knowledge, but this does not mean that the individual will adopt the innovation because the individual's attitudes also shape the adoption or rejection of the innovation" (p. 16). Similarly, Hassinger (1959), cited in Jacobsen (1998), "argues that even if individuals are exposed to innovation messages, such exposure will have little effect unless the innovation perceived was relevant to the individual's needs and as consistent with the individual's attitudes and beliefs" (p. 14). Although this is true, in the case of this study, participants felt that the innovation was relevant to their individual needs attitudes and beliefs but that constraints within the system hampered whatever knowledge they did have and this is why diffusion of online technologies was so slow.

7.2.3 Skills with Technology

Understanding and knowledge does not necessarily mean that they possessed the necessary skills to engage with the technology at a systematic level. Since online media

changes frequently, participants needed ongoing training on Learning Management Systems and online media to enhance their skills. In addition, they were not using these technologies on a regular basis and this hampered skills development. Participants believed that they acquired the necessary skills through the training provided by the university, but they found that using these skills to really engage with the technology was a challenge to them.

This shows that although the lecturers had knowledge and skills in using technology, transferring that knowledge and skills to teaching and learning in a classroom was an obstacle for them, particularly when transitioning from f2f to distance education where they were expected to teach online. It is not surprising then that as Mmapula said, it was easier to use online technologies in the f2f classroom. However, Lesego, with a PhD in adult education had experience in use of technology and more skills, was more innovative in changing her teaching approach by incorporating more online media. In other words, the more skills a participant had acquired, the more likely they were to be innovative with the technology.

Lesego highlighted the necessity of skills when she said:

> We can do distance education through print as we had been doing and also through f2f as is the custom at the University of Botswana, but I am saying it is time to go full online. Unfortunately we cannot due to two problems: resources, so that people can access online technology, and the capacity. Just because you have been trained as a teacher does not mean you will be a good online facilitator, and that is the issue of resources.

Participant responses have shown that one might possess knowledge but lack the skills to transfer that knowledge into practice. The data shows that it was relatively easy to train lecturers on how to use a Learning Management System (skills) and that although they could use the Learning Management Systems (abilities), they often lacked the deep understanding of that technology that is achieved when someone is immersed in technology both personally and professionally. This lack of deep knowledge slows down the diffusion process.

7.2.4 Beliefs in Technology

Rogers (2003) stated that, "compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (p. 15). Hoerup (2001) in Sahin (2006) describes that teachers' opinions, beliefs, values, and views are influenced by innovations. In terms of diffusion of an innovation, compatible beliefs are fundamental to the process.

7.2.4.1 Beliefs in Technology in face-to-face classrooms

The responses from participants on their beliefs about the value of online technologies were varied. Five participants said that online technology was beneficial, and some (three) said while beneficial, it was not possible at the University of Botswana, while one participant Mmapula, said she was not sure if technology adoption was

beneficial to teaching and learning. These contradictory arguments from participants resonate with Surry's (1997) views. According to Surry, there are those who believe that technology changes human behavior in positive ways and others that believe that technology is inherently evil. Although their views differ, they all believe that technology is a superior force and ultimately directs and determines change in an institution. This is a deterministic view. Opposed to determinists are instrumentalist theorists, who resonate with Rogers' (2003) views on the adoption and diffusion process of technology innovation. Instrumentalists believe that social conditions and human desires are the means for change and not technology itself (Surry & Farquhar, 1997). Technology, here, is seen as a gradual evolutionary process that is slow to be adopted, implemented, and used by potential adopters in the social system.

Therefore, in favor of an instrumentalist view, most participants believed there was a need to provide technology for students to study online. They also believed that technology on its own had value. This is why all participants used various online media even if their views were determinist or instrumentalist and why they are still described as early adopters. Even if the participant's view of technology was negative, they felt that technology was a superior force that determined change. In the sections below, participant's beliefs have been grouped around themes.

Technology in Face-to-Face Teaching: Many participants used online media in teaching such as Learning Management Systems, Web 2.0, social media, and other technologies such as computer software (mostly PowerPoint) and cellphones (especially

text messaging). Some classrooms were also equipped with SMART Boards. While most believed the value of technology in the classroom, Learning Management Systems were the least used. Most often, lecturers used Blackboard, for example, to post materials. They also minimally used discussion forums. But many other functions on Blackboard were not used. Some used the internet to access YouTube videos or relevant websites while teaching f2f classes. Others had Facebook pages for their classes.

Participants reported that when online media such as Blackboard was used it was often impossible to use properly or it was used in a way that did not serve the purpose it was meant to. Participants recognized the value of online technology in f2f teaching as a productive means to facilitate f2f teaching while at the same time they believed that it was not possible to currently use the technology properly. Participants believed that if online technology could be used successfully it would facilitate f2f teaching. All the participants mentioned that when they used a Learning Management System in f2f classes, they struggled with student uptake. They would post materials but students would not access the materials. Participants assumed that if students accessed the materials online, it would help students prepare for class and it would reduce their own teaching workload. The assumption was that when students attend f2f classroom sessions, the lecturer need not repeat what was posted online with great emphasis and the students' interaction rate would be high. Other views were that there was no need to print what was posted online and to distribute it again in class as handouts. Therefore, lecturers believed that online Learning Management Systems like Blackboard were valuable if used by learners and if lecturers were more fully supported to use them. There

was a comment from Lesego that: "University of Botswana should be slowly moving towards online programs, as this is an international approach". The view by Lesego concurs with other participants' opinions that online learning is important. In the end, all participants ended up providing printed handouts in class. Participants were disappointed by the seemingly lack of interest in technology by students.

In the absence of other technology-use, lecturers most often used PowerPoint slide presentations because it was compatible with their current needs, which was to complete the syllabus and provide students with clear and printable content. This tension of wanting to use online technologies and feeling unable to was clearly communicated by participants. All participants perceived online learning as important. Here is another comment from Lesego: … why should I be in front of those kids in a f2f classroom when online media is there and the resources are available, I could do it online. ….

A clear theme that emerged from participants was the perspective that although online technologies were available it was not possible to use them. Kutlo said: "I posted the material through Blackboard and students still are not prepared for the lesson and come to class without a handout". During my observations I found that a few f2f students brought their own laptops to the classroom yet they did not access the PowerPoint slides that were posted online through Blackboard by the lecturer. Participants felt that students were aware that handouts would be provided in class and this was the reason for students not accessing the online materials. It is possible to speculate other reasons. Many students cannot afford the cost of printing out the online materials so they prefer the

lecturer to print these out. Many students do not know how to use the online Learning Management Systems even though computers and training are available. In addition, based on observations, during f2f classroom sessions Oratile could not use the SMART Board when teaching f2f graduate students because of electricity cutouts. The lack of infrastructure and resources could be why students do not access materials.

Briefly, participants believed that online media is possible at the University of Botswana if the lecturers are fully supported by the system and if students use it. The participants' views concur with Rogers' (2003) idea that even though technology is diffused in the system by early adopters it does not guarantee that the end users such as f2f students, will use it.

7.2.4.2 Value of Technology in Distance Education

Several themes emerged in relation to beliefs about the value of technology in distance education. *Lack of Infrastructure:* Distance education, at the University of Botswana, started with a correspondence delivery program using print, TV, and radio. From 2001, when the University of Botswana introduced online learning technologies, distance education became blended whereby students came onto campus at the beginning of semester to collect printed modules and to receive instruction on how to use the modules. Learners were expected to return to their usually remote places of residence and work independently using the modules. At the end of the semester, learners returned to the University of Botswana to complete a one-week residency, revision of the modules

and exams. Over time, the idea was that the print modules would be replaced by online courses that students could access from their remote regions. Ultimately, the purpose was to teach fully online. However, participants at the University of Botswana found that although the latest online media and other technologies were available, distance education learners were not able to use online media. A most basic problem was that distance education learners could not connect to the internet as most of them were in remote rural areas and internet connections are rare. Participants, instead, used technologies and telecommunications media that were compatible to their conditions to contact and inform students such as cellphones and landline-telephones, respectively, because these were accessible to all students. However, as Kutlo commented: "It is surprising to find that learners are able to access complex online media for personal consumption but are not accessing online materials to learn". Learning Management Systems were available when distance learners came on campus for their residential sessions but, of course, distance education learners did not access online materials, since they had even less experience with online learning technologies than f2f students. Lecturers generally concluded that distance education learners, like f2f students, preferred handouts.

It is worth mentioning that participants expressed a number of concerns around distance education. 1) They felt that although distance education learners were supposed to learn independently using the module, most of them did not. For instance, Oratile commented, "… because we expect independent learning from distance education learners, we are facilitators, guiders, and/or tutors, not lecturers". But in practice, lecturers found that when distance education learners came for their residential sessions,

these learners had not covered the material on their own. Instead, lecturers had to teach all the modules in that one week. 2) Participants mentioned that distance learners often did not have high school qualifications and consequently were ill prepared to learn on their own. 3) A third factor was that many distance learners struggled with English language proficiency. These three factors also contributed to the fact that distance learners did not access online materials. For instance, Mpho said that when he taught distance education learners his method of teaching changed to focusing on the completion of the syllabus, thus he adjusted the material covered and provided distance education learners with more printed handouts instead of asking them to access the material online.

Yet ultimately participants stated that they believed the University of Botswana should offer fully online programs to distance learners although not many of them could see how this would be possible with the lack of computer/online readiness among students, the lack of access to computers, slow or non-existent networks or electricity cut-outs.

Participants were different in their use of technology. The technologies they used varied based on their characteristics, knowledge, skills and beliefs but all were identified as early adopters. All participants believed in the value of technology one way or another but believed that the University of Botswana had a long way to go to transition from f2f to online learning. Their views concurs with Masalela's (2011) study conducted at the University of Botswana which found that this transition should be done gradually, that the University of Botswana should make sure lecturers are comfortable on using online

learning technology and that lecturers and students need comprehensive training on how to use online learning technologies.

7.3 What are the Challenges Faced by these Early Adopters

The challenges reported by participants are presented here based on Rogers' (2003) three concepts of compatibility of technology, social systems, and early adopters.

7.3.1 Compatibility of Technology

As has been mentioned, although participants believe technology facilitates the teaching and learning process, they reported that even though online technology was available, it was little used by students and difficult to use by lecturers. Therefore, it was more compatible to use PowerPoint. According to Rogers' (2003) the adoption and diffusion rate of technology increases when it is compatible to the values, needs, beliefs, and experiences of early adopters. Online technology is not compatible for the following reasons: Lack of infrastructure for students, lack of general technology use and lack of time to develop technology proficiency.

Lack of Technology Infrastructure for Students: This has been mentioned before but it remains a substantial problem. In a context where there is intermittent electricity and little networked internet infrastructure, it is very difficult to set up online learning that is sustainable. Dial-up internet connection, the most common kind of connection where it

is available, is expensive and beyond the affordability of most students, especially distance education students who are characteristically the poorest. There was consensus from participants that lack of resources affected technology use. As Lesego reported, on the electricity outages in the country:

> The reality is Botswana as a country is still behind when it comes to the learning technologies because there is a problem with network connections in remote rural areas and even in the towns and cities we still feel it. Therefore, the distance education program is still going to run like when it started as a print-based program and now is using a module blended with f2f classroom teaching to facilitate their learning during the residential sessions on campus. It started with distance education in 1982 and it is still the same. The only difference is we are exposed to online technologies, which are impossible to use. No matter how committed or active early adopters are, functioning within an environment such as this poses significant problems.

Lack of technology use: Clearly both f2f students and distance education learners were not using the available online technology. Distance education learners, during residential sessions on campus, did not access online materials posted through Blackboard. Face-to-face students did not access their regular classroom materials online despite ongoing encouragement by lecturers. A more compatible technology currently is the use of cellphones. However, it is costly for f2f students and distance education learners to connect to the internet via their cellphones, as was noted by Serero, Lesego, and Itumeleng.

Some f2f students did own laptop computers but these were very small in number. Many cannot afford to own laptops. The university does provide students with access to

computers via computer labs but again, students did not make use of these for online learning technologies.

Participants believe that for the use of technology and online learning to be successful f2f students and distance education learners should be using it; otherwise, the use of technology in the system will fail, as is the case now based on this study's reports. Therefore, lack of technology use by f2f students and distance education learners impacts negatively on participants' use of technology.

Lack of Time to Develop Technology Proficiency: Participants in this study commonly viewed time as having a major impact on the adoption and diffusion of technology in teaching and learning when transitioning from f2f to online learning. The lecturers' views concur with Rogers' (2003) concept of the time aspect, that it was a strength as far as innovation diffusion is concerned. The participants as such felt that the preparation of online course components was time consuming. Many mentioned that their workload increased when they engaged with online learning. Lorato, for example, stated that in online learning a lecturer need to respond to each individual student. Whereas, in a f2f classroom, lecturer could respond to all students at the same time.

Participants were also concerned about time to learn how to use online technologies. One participant, Serero, commented:

> There is no time to even practice what we learn through Centre for Academic Development, apply it to f2f or online learning, as we always get stuck in front of learners. We should be allowed time to practice this on our computers but we end up using online technologies in the classroom for both f2f students and distance education learners.

Concerning time, Mmapula said,

> When the short break comes in the month of May/June for face-to-face students, the distance education learners come for their residential sessions, and at the same time Centre for Academic Development offers training and workshops on use of technology, when is our time to rest?

Lecturers said that they were allocated a limited time to teach the syllabus, which put enormous pressure on their f2f classes. In addition, they were required to teach distance learners during their residential sessions and as previously noted, had to teach the whole syllabus when they should only be revising. To also attend training workshops to implement new technologies or methods of teaching was almost impossible. There were also timetable clashes where teaching times overlapped with training schedules. Participants said that using online learning technologies was difficult because time was not allocated for them to learn and practice using online media and thus they viewed online learning as a challenge. For instance, Serero captured other participants' views by remarking: "For instance, we are told that workshops/training are available for free to attend on how to use technology for teaching and learning, which at times clashes with our class schedules and free times". There were also many logistical problems: scheduling of training without venues; sending timetables out at the last minute to lecturers; and scheduling weekend training without considering lecturers' personal time.

According to Rogers (2003) time is ignored in most behavioral research. He argues that it is very important to think about time in diffusion research. He suggests that an individual's decision to adopt, and the rate of adoption necessarily includes time dimensions. Like Rogers, participants believed that it takes time to learn and adjust to changes in transitioning from face-to-face to online learning. Therefore, time is a very important concept that affects the transition process to online learning.

7.3.2 The Social System

According to Rogers (2003) a social system is an environment within which an individual operates. The organization in this context refers to the University of Botswana in which the participants acted as early adopters of technology innovations and diffusion. Rogers argues that individuals are governed by the boundaries of the social system. Similarly, the participants in this study were governed by the University of Botswana administration and environment. Participants felt that online learning at the University of Botswana was driven by a top-down approach, where mandates were imposed without involving the people who were going to implement the online learning policies. Lesego's comments capture the essence of this point: "You know, when I arrived from abroad upon completion of my PhD program, I was just told and instructed by the University of Botswana administration that you go and teach f2f and also distance education programs".

Top-Down Approach: Participants generally believed that the University of Botswana imposed policies without initially involving them when they were experts in their fields. Participants felt that the University of Botswana did not include them as planning members when new technology innovations were introduced in the system. They remarked that instructions were imposed through the system by issuing mandates. Serero noted: "University of Botswana is imposing policies on us like teaching distance education courses and the use of technology without involving us in the initial stages of planning". Lecturers noted that although they were pressured by administration and policies at the University of Botswana, this did not mean that they could also force students to use online media. Participants in this study were concerned about their lack of proper involvement in the implementation of online learning. They felt that with consultation and better communication to ensure their acceptance of the adoption and diffusion of technology innovation, they might be able to compel students to use online learning.

7.4 Early Adopters - Lecturers' Emotions

Participants showed some unexpected emotions as I was recording their responses from the in-depth interviews. Reporting on these emotions of lecturers was unexpected data. I have included this discussion on the emotions here as an additional way to understand the participants' teaching experiences, beliefs, behavior with technology.

Participants shared their grievances, anger, and unhappiness with online learning. Several emotions emerged from participants in this research study.

Participants generally felt that they were not given enough support to adopt and diffuse the technology into the system. Serero said rushing them to implement technologies in pedagogies caused her to fear and resist using online media. The issue of lack of support needs some clarification. The university provided support in terms of professional development and training. However, many participants felt that they could not participate in the training or that the training did not provide them with the support they needed to implement their learning. Keitumetse provided a useful example here: Keitumetse said that he attended about fifteen short courses on teaching and online technologies. He was also trained on each of the Learning Management Systems such as WebCT, Blackboard, and Moodle, and how to use videos in teaching and learning. After these courses, offered by the Centre for Academic Development, he requested a course shell to prepare a course for online purposes by adding modules and notes for f2f students and distance education learners to access as and when the need arises. Keitumetse said that lecturers had to take their own initiative. He said: "They [the university] will just invite interested lecturers to attend [training] if they have time and if they are interested". His point here is that the training is voluntary while the implementation of online learning is mandatory. Although training was available, participants indicated that it was hard to attend. For instance Kutlo's commented:

> At University of Botswana there is the mainstreaming distance education policy that actually outlines the responsibilities for all stakeholders but no one cares because Centre for Continuing Education, they are concerned with the administrative aspect of adult education and we are concerned with the academic aspect and in terms of working together to deliver the distance education programs sometimes it's a problem. I presented a paper one time at Botswana College of Distance and Open Learning about the arrangement of distance education at University of Botswana and I outlined some of the problems where we find that a lot of things do not work for distance education.

Another participant, Lesego, said:

> … I am interested in the students and I don't want them to get a raw deal. I want them to get what's best from their lecturer and I cannot fight for another department, you know what I mean. So issues or problems at Centre for Continuing Education are not my baby, you see what I mean, because that's a program where you are labeled for teaching but the program belongs to somebody else.

The lecturers noted that they had been sent abroad for further studies, and when they came back, the University of Botswana expected them to implement policies by teaching programs as specified without having been guided and involved in the initial plans:

> You just go for training abroad and when you come back you are told that we have a crisis here as we need someone to teach this. Here is the module, please teach, and that's the end of it. Students come and register and they have been told that your lecturer is so and so. When they get here they expect you to teach them and they don't even understand their program themselves. That's why I am saying it is part of the job. You are hired as a lecturer in the university and you are expected to go and teach (Lesego).

Furthermore, she said that the Department of Distance Education Unit at the Centre for Continuing Education is the coordinator from the administrative side. They

were responsible for overseeing the distance education programs by hiring tutors, module writers and managing the distance education program:

> … this is how they put it: we have an Adult Education program by distance mode, and it is expected that you guys who are teaching the full-time program you also teach here because this is your area, just like Business, just like Primary Education, just like Law, just like Social Work, that is how it is done. (Lesego).

The lecturer said that things are not in place, and the coordination is not properly carried out by the administration Department of Distance Education Unit/Centre for Continuing Education:

> … surely even when it comes to resources the full-time students are better off than those ones, because even your own employment. I was hired to come and teach f2f students, not the distance. So for me really, most of these problems whether they are administrative or structural, or whatever, most of it needs to be addressed. I don't know but for me I just feel that they just have to come back to the department. Experts, from the Department of Distance Education Unit in the Centre for Continuation of Education should come do the administration here in the Department of Adult Education, Faculty of Education. Then they will have ownership (Lesego).

Lesego argues that the university needs to hire more people:

> People who are not even distance education or adult education [experts], precisely because of that. When I was hired I was applying to be a full-time lecturer and to teach full-time students, …but if you are going to engage me on weekends then this is extra work. Then they will say ok now you are talking of appreciation, which is 70 pula per course.

Some participants wanted to be teaching distance education learners in addition to their normal f2f teaching. Others were against this. Some lecturers found it unfair

because the workload is extensive for distance learning. For example, Lorato said, "since it is a voluntary type of thing, I find the reward as an appreciation kind of thing". Lesego further argued that there was a reaction to overworking lecturers: "That is why we got to a point where colleagues were saying … I am not going to teach, that is why they are nowadays sourcing from outside".

What Lesego means here is that the University of Botswana hires tutors from other institutions instead of from within the Department of Adult Education. The participants believed that if tutors are hired from outside their Department of Adult Education, they should be involved in the hiring process because they do not want their program to be run by unqualified tutors.

The main reasons for these emotional responses seem to be overwork and a lack of involvement in the decision-making. Many felt helpless, and pressured through a top-down approach to do their work, which they believe affects the success of online learning. According to Rogers (2003) the organization should work together towards a common goal because if one section fails in the adoption and diffusion of technology innovation will not be spread, hence the rate of adoption per individual varies. Similarly, although from a distance education concept with regard to the use of technology, key thinkers in distance education argue that distance education is complex and there is a need to look at it from a systems approach (Moore & Kearsely, 2012; Saba, 2013). What they are saying is that distance education and online learning has components with activities working together and within which are subsystems and sub-subsystems; therefore, if one of the

components within the system has problems it has an impact on all other components in the system.

7.5 Conclusions

The main conclusions for this chapter are identified and are discussed below. These include: 1) the social system, while providing resources, is constraining; 2) early adopters face constraints within a top-down social system; and (3) online technologies are used in the f2f classroom but not online.

The social system: while providing resources, is constraining. Although the University of Botswana through Centre for Academic Development provided professional development and training to lecturers for online learning, lecturers believed the training was not adequate enough to sustain a transfer of learning to implementation. In addition, training was voluntary and there were scheduling issues, which prevented participants from attending. Participants also felt overworked and overloaded and did not have time to participate in training. While computers and online facilities were available to students, few made use of them.

Early adopters face constraints in a top-down system: Participants felt that online learning at the University of Botswana's was policy-driven from the top-down. They felt this was harmful because their opinions were not taken into account and they were the

ones implementing online learning. They felt that they were not involved in decision-making and were left out of the process. A consequence of this top-down approach is that even though all participants felt that online learning was important and necessary, they tended to use technologies (like PowerPoint presentations) most often because this was more compatible with the conditions under which they taught.

Use of online technologies in the face-to-face classroom: Online learning for distance education does not exist despite overt intentions by the University. This is due, mostly, to larger infrastructural problems. Surprisingly, the most use of online technology is in the f2f classroom. While the use of online technologies in f2f classrooms is still low, diffusion of technology is happening. This is mostly due to the early adopters in this study and others like them at the university. Although the university has made considerable attempts to enable the adoption of learning technologies, the constraints are enormous. Consequently, the use of online technologies in the f2f classrooms is a step in the right direction.

This chapter reports on the results of the interview data and uses the two questions as a way to structure the chapter. The first question was on the characteristics of early adopters, particularly their knowledge, skills, and beliefs. Rogers views early adopters as innovators, leaders, and localites who can also be change agents. It was found in the study that participants had all these characteristics, as noted by Rogers. However, the study showed that participants were constrained by the social system and could not fully apply themselves based on their characteristics. In addition, participants had knowledge

in online learning technologies through training but were unable to transfer that learning into practical skills in a sustained way because of a lack of time.

The second question was about the challenges faced by participants, which were grouped under Rogers' (2003) three concepts. Firstly, Rogers argues that when the compatibility of technology is high the rate of adoption is high. What this study shows is that there is little compatibility with online learning technologies. Secondly, the social system operates based on its structures that guide the individual adopters of technology (Rogers, 2003). Participants reported that University of Botswana has a top-down approach to technology adoption, which, they feel, hinders the diffusion process. Thirdly, from the perspectives of early adopters, Rogers argues that the individual early adopters influence peers as potential adopters. Early adopters, in this study, did influence their peers. Throughout the interviews, emotions emerged as a further theme. Participants indicated that they felt overworked and overloaded. In sum, they were not happy with the system. This is important because if these early adopters feel disloyal to the system, they are less likely to promote the diffusion of technology.

This chapter has shown that although there is little online technology diffusion happening at the University of Botswana, Department of Adult Education, early adopters are able to generate pockets of diffusion albeit within enormous constraints.

CHAPTER 8 – CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

8.1 Introduction

The purpose of this study was to explore experiences with technology among early adopters in the transition from classroom to distance education to online learning at the University of Botswana. The research design employed was a qualitative case study approach, which collected data on the experiences of technology among early adopters. For the purpose of exploring and understanding technology diffusion, participants were purposefully selected from the Department of Adult Education, Faculty of Education, at the University of Botswana. The Department of Adult Education is a key department for the implementation of both national and university policies and is involved in teaching f2f courses and distance education. Hopes of rolling out online learning and achieving widespread education access lie within this department. Semi-structured interviews were the major source of data for this study, as were observations of f2f classroom teaching. Secondary documents and artifacts were also used as sources of data. Rogers' (2003) DoI theory was used as a conceptual framework to analyze the micro and macro perspectives of technology diffusion. Specifically, Rogers' three main concepts—compatibility of technology, social systems, and early adopters—were used as a guide to understand how participants' experiences with technology influenced the transition process. It was important to include an analysis of the national educational policy environment since this provides the impetus for much of the drive for online learning by institutions, such as the University of Botswana, in the country. Chapter six focused on

presenting initial data on participants. From the descriptions of participants' demographic data, profiles, and artifacts, three conclusions were reached:

1. Participants experienced pressure from the system, which resulted in teacher-centered learning, a tension which greatly undermines the use of online learning
2. When online learning is used, it is being used in f2f classrooms
3. No online technology was being used in distance education

In chapter seven, the two research sub-questions were used to analyze participants' responses in the interviews. The purpose of chapter seven was, therefore, to discuss what the participants thought about moving to online learning. The three conclusions found that participant responses to the research questions were:

1. The social system, while providing considerable resources, was constraining
2. Early adopters faced substantial constraints within a top-down social system
3. Lecturers mostly used technology that was compatible to their context

The first section of this chapter discusses and interprets the main conclusions drawn after synthesizing the findings from chapters six and seven. The second section states the implications, and evaluates the study. The final sections present recommendations for future research and conclusions for the chapter.

8.2 Key findings from the study

The three overall conclusions were derived from the findings of this study:

1. Little online technology is being diffused.
2. The top-down technology adoption approach of the University of Botswana has contributed to an environment that promotes minimal technology diffusion and supports technology use that is compatible to existing conditions.
3. Any diffusion of online technologies that is taking place occurs in the f2f classroom.

Each of these findings will be discussed in turn in the following sections.

8.2.1 Little online Technology is being diffused

In the Department of Adult Education, based on the results of this study, participants used very little technology outside the f2f classroom. Even in the f2f classroom, while some online technologies were being used, these relied on specific lecturers championing online learning technologies. No online technologies were being used in distance education. Distance education remains print-based. Even during residential sessions on campus, students did not use the online facilities. Consequently, there is no transition from f2f to distance online technologies.

The main reason for this appears to be infrastructure challenges. According to Rogers (1995, 2003) when an individual has knowledge about technology, for instance, they form an attitude toward the innovation. If the attitude is positive and compatible then the adoption and diffusion of technology innovation follows a somewhat linear direction. Early adopters innovate with the technology and encourage late adopters to use the technology. In this way, late adopters more easily adopt it. However, in contexts like Botswana, the linear flow of technology adoption is halted because of a very basic lack of resources. This issue is also confirmed in the research literature. Research from universities in Sub-Saharan Africa shows that the major impeding factor to technology diffusion is the huge gap between urban and rural regions in terms of access to ICTs (Farrell & Isaac, 2007). One of the major drawbacks is intermittent electricity. Another is the lack of internet connectivity for the general public. Sebusang, Maruping, and Chumai (2005) in Botswana revealed that broadband access was not within the reach of the population at large. The study also showed that a lack of connectivity was not the only problem, knowledge, skills, and experiences of using technology were also lacking. These points are further confirmed by other research on online distance education in southern Africa (Farrell, & Isaacs, 2007; Farrell, Isaacs, & Trucano, 2007; Opati, 2013). My study confirms these findings, because distance education learners are generally located in remote rural areas, where network connections are lacking and accessing online materials was not possible.

The Botswana Vision 2016 emphasized the importance that all urban and rural areas be networked and connected to facilitate accessibility to information for the future

knowledge society. This has not been implemented. There is no doubt that the University of Botswana was following its policy mandates and that online technology was available to all lecturers and students. Learning Management Systems are available and a range of training options were delivered regularly. However, even though technology is accessible on campus both f2f students and distance education learners still did not use it. The findings concur with the literature that, in some contexts, technology can be available and still not accessed. This means that even if the system is well resourced with a rich technology infrastructure it does not necessarily mean that individual adopters will be able to easily access the available technology (Kyakulumbye, Olobo, & Kisenyi, 2013). The study showed that if students, particularly, are not able to access technology, academic staff, even if they are early adopters, will not be able to apply the use of technology in the system even though it may be available and accessible to them.

Other studies confirm this point and show that when lecturers and students use of technology is lacking, it hinders and or slows down technology use in teaching and learning, and instead other technologies are used, mostly to transfer information in f2f contexts, as I found in this study (Opati, (2013). For instance, Moghaddam, (2017) findings reveal that, “teachers generally use ICTs to transfer the content to the students” (p. 1). Similarly, Gyamfi (2015) in a Ghanaian university found that slow internet connectivity and a lack of internet access hindered the effectiveness of the blended learning environment for lecturers and students. In addition, Kyakulumbye, Olobo, & Kisenyi, 2013 found that ICT infrastructure had a strong relationship on ICT utilization at the Ugandan Christian University. The findings of this study concur with the literature

that states that where there is lack of infrastructure this leads to barriers to technology diffusion (Krishnakumar & Kumar, 2011). In addition, Chigona & Chigona, (2010) concluded in their findings that insufficient equipment are factors affecting the integration of ICT in teaching and learning.

8.2.2 Compatible Technologies are being used

The findings concur with Rogers' (2003) views on compatibility and other studies on higher education from the context of African and Western universities that indicated that when compatibility is high the adoption and diffusion rate of technology innovation increases (Jacobsen, 1998; Kesee & Shepard, 2011; Masalela, 2009; Samarawickrema & Stacey, 2007). The findings from this study show that, for participants, online learning technologies are not compatible with the existing context. Even though participants believe that online learning is important and useful to teaching and learning, they do not believe it is possible with the current infrastructure and other challenges. On this note, this study showed that students did not recognize the value of online space; rather, they preferred the physical f2f classroom, where the lecturers mostly teach by providing information to them and supplementing their f2f classroom teaching with PowerPoint presentations and printed handouts.

Participants believed that the students did not use technology because of the low levels of technology use among students generally. This issue is confirmed by other

studies. For example, in a Ghanaian university context, Asunka (2008) argues that students perceived online learning as complex, and demanding and time consuming. It is possible that students in the Botswana context have similar experiences. This also concurs with Rogers' (2003) views that it takes time to adopt and diffuse technology, thus students needs time and assistance to learn to use technology. They do not do so voluntarily especially within contexts where there is not a culture of technology use. Lecturers, then, used the technologies that best suited their contexts and current experiences. In this case, the most often used technology was PowerPoint. Since lecturers were under extreme pressure to complete syllabi within the semester, they resorted to teacher-centered lecturing using PowerPoint presentations. This was most compatible with participants' circumstances.

Participants were selected because they were involved in the diffusion of technology. They were identified as early adopters because of their use of online technologies, and because they taught both f2f and distance education. Why, then, were participants using PowerPoint more than the online technologies? Participants generally believed in the value of online learning. De Gagne and Walters (2009), Marcy (2007) show that faculty generally do transition from traditional f2f classroom teaching to online, and transfer their f2f experiences into the online learning environment. However, this has not been the case in this study. From the data, it is clear that the top-down approach to policy implementation provided a major barrier to technology diffusion. This concurs with the literature (Masalela, 2011; Thomas, 2008). For example, Masalela (2011) argues that lecturers were not involved in planning but only at the implementation stages and

were rather felt the system is forcing them to use technology without allowing them time to learn and practice using it. Masalela (2011) and Thomas (2008) also noted that the University of Botswana did not communicate the initial stages of technology innovation decision-making to lecturers.

According to Rogers (1995) the organization as a social system involves all individuals for a common goal; otherwise, the technology innovation rate decreases. Studies conducted in Africa, Europe, North America, and Australia have similar reports of universities operating through a top-down approach, which impacts on the adoption and diffusion of technology use by lecturers (Masalela, 2011; Noble, 1998; Surry, 1997; Thomas, 2008; Uys, 2001). The top-down constraints on lecturers using technology in transitioning from f2f to online learning have been a topic of much research (Jetnikoff, 2015; Masalela, 2011; Opati, 2013; Vajargah, Jahani, & Azadmanesh, 2010).

At the University of Botswana, these participants believe in online learning but due to the challenges they were faced with in their environment and the context in which they operate, they were compelled to be more inclined to use technologies that were easier and would help them to achieve their goals in this context. Diffusion depends on the culture, context and situation, which in the end lead to compatible technology use. In the case of this study, technology use by participants concurs with Rogers (2003) views on the concept of compatibility of technology. This lack of compatibility for online learning technologies in contexts similar to Botswana has been confirmed in many other studies (Buabeng-Andoh, 2012; Sahin, 2006).

From Rogers' (2003) perspective, a change agent (such as an early adopter) does not operate in isolation; rather, he/she operates from a micro to macro level based on prior experiences which impact on the social change, the organization, individual adopters and the technology being diffused. The point is the structures of the social system form a context within which the individual operates. Within this context, any technology innovation must be planned, organized and clearly communicated to the opinion leaders, who in this case are the participants, if the innovation is to be diffused (Jacobsen, 1998; Samarawickrema & Stacey, 2007).

Participants reported that there was lack of support because they were not allowed time to learn and practice the use of technology. A policy-driven top-down approach to technology adoption is characterized by a lack of support, leading to impacts on time management, and pressurized to complete the syllabuses within a semester. Instead, the system pressured them to complete the syllabuses without even considering the level of understanding of f2f students and distance education learners. The findings concur with other studies in African higher institutions of learning on the lack of support felt by lecturers in universities (Agbonlahor, 2006; Masalela, 2011; Thomas, 2008; Totolo, 2007), which negatively impacts on the adoption and diffusion of technology. Rogers (2003) argued that the concept of time is an important consideration because individual adoption of technology is based on time.

Briefly, the main conclusion in this section was that participants felt they were being driven by a top-down policy approach of technology adoption, which contributed to

the lack of support by not allowing them enough time to learn to use technology in teaching and learning, and pressuring them to complete syllabi. This also concurs with the literature from the Western world (Surry, 1997). For instance, developer-based theorists focus on organizations making changes, which contrasts with the adopter-based theories, which are focused more on the interpersonal aspects of the innovation diffusion from a bottom-up approach (Surry, 1997). In other words, the communication level is more effective from the bottom-up instead of top to bottom as this means individual adopters are compelled to implement innovations. In addition, Noble (1998) from the context of the University of York in Toronto, Canada, found in his study that lecturers/professors went on strike because they were being forced to adopt web-based learning and also students said that they did not pay for cyber learning.

8.2.3 Diffusion of Technology in F2F Classrooms

Despite the lack of diffusion of online technologies to distance education, this study has shown that technology diffusion is taking place within f2f classrooms. It is in the f2f classroom that these early adopters were engaging with online Learning Management Systems, social media and various Web 2.0 technologies. There were pressures on the participants that led them to teacher-centered approaches to teaching, even though they were aware of, and wanted to engage in, student-centered modes of teaching. Yet, they still engaged in online media to some extent – some more than others. Many of the participants believed that online technologies would ultimately encourage

more student-centered approaches. This is a point that is confirmed in the research literature. Stacey and Wiesenberg (2007) found that "majority of their participants admitted being more teacher-centered in the f2f mode and more learner centered in online teaching" (p. 36). Despite the pressures on completing syllabi on time (which led to teacher-centered approaches), the lack of uptake on online technologies by students, the inability to make the most useful use of the training available, the frustration with the university administration and the general feel of being overworked, these participants still used online technologies in their classrooms. Some felt forced to do so (Masalela, 2011; Noble, 1998, Thomas, 2008) because of the inevitability of technology (Surry, 1997), but most others did so because they believed in the value of technology (Mufeti, Mbale, & Suresh, 2011; Stacey & Wiesenberg, 2007).

In this way, some of the early adopters in this study can be seen as change agents. However small their use of technology, they were still using the technology and influencing others around them. Currently there is little student uptake, but over time the potential for uptake could change. They may not drive change at the pace expected in more developed countries but their continual use of the technology will ensure that the technology-use continues to be spread throughout the system. According to Rogers (2003) change agents are leaders who initiate, instruct and/or influence those in the system to implement change: "A change agent is an individual who influences clients' innovation decisions in a direction deemed desirable by a change agency" (p. 312). Change agents initiate change by using an innovative technology and encouraging its adoption within the social system, which impacts on the rate of adoption (Ellsworth,

2000; Jacobsen, 1998; Less, 2003). Less (2003) has argued that change agents usually occupy positions of power such as senior administration or university presidents. Yet other literature has noted that change agents are any individuals involved in making changes in the organization (Jacobsen, 1998; Hall & Hord, 1987, 2014; Hall & Loucks, 1979).

There is no doubt that these participants, as change agents, face major challenges. They found they were not able to apply their leadership skills, which as noted by Rogers (2003) is necessary. Participants felt they could not influence the university administration because of the top-down approach taken by the University of Botswana.

8.3 Implications of Theory and Practice

This study confirms what other studies in similar contexts have found: that technology innovation and diffusion is severely hampered by lack of infrastructure, poor resources and a technology-weak cultural base. A top-down approach to policy implementation at the university has provided further obstacles and the contextual environment of overwork, lack of time, poor student uptake and administration issues has impeded the diffusion of online technologies to distance education at the University of Botswana. These hindrances to the adoption and diffusion of technology at the University of Botswana experienced by lecturers in the Department of Adult Education are similar to those that have been found by researchers in other university contexts such

as in the UK, US, Canada, Australia, New Zealand, Nigeria, and South Africa (Buabeng-Adoh, 2012; Chiasson, Terras, & Smart, 2013; Chigona & Chigona, 2010; De Gagne & Walters, 2009; Johnson, 2008; Masalela, 2006). Yet, what this study also shows and can contribute to the debates is that technology diffusion is happening in f2f classrooms. Rogers' framework has been significant in allowing an analysis of technology diffusion in this context that would not have been possible otherwise, however, not all technology diffusion takes place along linear paths. Perhaps in Botswana, technology innovation needs to grow in the f2f classroom first. Researchers from US and Australian university contexts argue that moving to online technologies is an individual journey, which takes time because of contextual differences (Chiasson, Terras, & Smart, 2013; Macy, 2007; Redmond, 2011).

The implications for practice are that technology diffusion in f2f classrooms need to be encouraged and as other researchers have suggested, strategies should be put in place to alleviate the problems identified in this study (Masalela, 2011; Thomas, 2008; Jacobsen, 1998; Oladokun & Aina, 2011).

This study has implications for Botswana's national policies, which have emphasized that everyone has the right to education and education should be available and accessible to educate the nation for a more knowledgeable society (Revised National Policy on Education, 1994; Vision 2016, 1997). The Botswana government invested significantly in information technology with its infrastructure to be used in Botswana's education systems.

8.4 Limitations of the Study

There are two key limitations to this study: 1) The scope of the study was limited to the Department of Adult Education. It is impossible to generalize from one unit and apply the findings of this study across the university. Additional research on other units would help to confirm or add to the results of this study. 2) The limited number of participants in the sample. The population pool used for the current study was a small membership of a unit rather than the total faculty population. The lecturers chosen for the study were based on their position as instructors who used technology. Extending the sample to other lecturers who do not use technology could provide with insights as to why they are not innovating with technology. In other words, a broad survey of university academic teaching staff would yield useful data. Despite these limitations, the advantage of the small sample size was the depth of experience and perceptions gained from the participants.

8.5 Recommendations

The following recommendations are offered:

1. Online technologies in f2f classrooms should be facilitated and encouraged.
2. Online technologies should be promoted among students and students should receive training.
3. Lecturers should be included in decision-making involving technology. As a closing remark, there is need to develop policies in context because they facilitate the

development and guidance of systems such as education in Botswana, but there is need to involve the end users as early adopters and implementers of these policies as they are the major change agents in social systems such as organizations like the University of Botswana.

4. Professional development and training for lecturers should be supported while taking time management into consideration.

5. The University of Botswana and Faculty of Education, Department of Adult Education with the Department of Distance Education Unit in the Center of Continuing Education should work out the planning and management of the programs and courses for smooth professional coordination that also sets the ownership of programs clearly.

6. The university should make sure that equipment and resources are available and repaired on time for the smooth continuation of the programs.

8.6 Future Research

The study was conducted by focusing on a small sample that was purposively selected specifically to understand the transition from f2f to distance education to online learning at the University of Botswana in the Department of Adult Education. Therefore, the following are areas to be researched as a continuation of this study:

1. Research students' use of technology in all faculties and departments

2. Compare with Department of Distance Education Unit/Centre for Continuing Education at the University of Botswana, college of distance and open learning in Botswana is dedicated to online technology as the first open and distance learning university in Botswana

3. The quantitative aspect is to capture more areas to be generalized, such as faculties, administrators, and government departments, and the qualitative aspect is to interview for the purpose of understanding.

8.7 Conclusions of the Chapter

The purpose of this study was to explore the experiences of participants identified as early adopters of technology innovation in the transition from teaching f2f to distance education to online learning. The study discussed who the participants were, the environment in which they worked as lecturers, their experiences in teaching and technology, and their beliefs about online technologies and online learning. Based on this, three overall conclusions were found which identifies this study as different from other studies noted in the literature with similar findings:

1. Very little technology was used outside the face-to-face classroom.

2. The top-down technology adoption approach at the University of Botswana contributed to an environment that promoted minimal technology use and supported compatible technology use.

3. Where participants did use online technologies, it was in the f2f classroom.

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APPENDICES

Appendix A

Memorial University ICEHR Approval - Canada

MEMORIAL UNIVERSITY

Interdisciplinary Committee on Ethics in Human Research (ICEHR)

Office of Research Services
St. John's, NL Canada A1C 5S7
Tel: 709 864 2561 Fax: 709 864 4612
www.mun.ca/research

ICEHR Number:	**20140915-ED**
Approval Period:	December 16, 2013 – December 31, 2014
Funding Source:	University of Botswana [funds will not be administered at Memorial University]
Responsible Faculty:	Dr. Cecile Badenhorst and Dr. Tim Seifert Faculty of Education
Title of Project:	*Past experiences of technology among early adopters in the transition from classroom to print to online distance education materials: a case study at the University of Botswana*

December 16, 2013

Mrs. Seitebaleng Dintoe
Faculty of Education
Memorial University of Newfoundland

Dear Mrs. Dintoe:

Thank you for your email correspondence of December 5, 2013 addressing the issues raised by the Interdisciplinary Committee on Ethics in Human Research (ICEHR) concerning the above-named research project.

The ICEHR has re-examined the proposal with the clarification and revisions submitted, and is satisfied that the concerns raised by the Committee have been adequately addressed. In accordance with the *Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans (TCPS2)*, the project has been granted *full ethics clearance* to December 31, 2014. Once obtained, please provide copies of all permissions from the University of Botswana to the ICEHR for our files.

If you need to make changes during the course of the project which may give rise to ethical concerns, please forward an amendment request with a description of these changes to Theresa Heath at icehr@mun.ca for the Committee's consideration.

The *TCPS2* requires that you submit an annual status report on your project to the ICEHR before December 31, 2014. If you plan to continue the project, you need to request renewal of your ethics clearance, including a brief summary on the progress of your research. When the project no longer requires contact with human participants, is completed and/or terminated, you need to provide the final report with a brief summary, and your file will be closed. The annual update form is on the ICEHR website at http://www.mun.ca/research/ethics/humans/icehr/applications/.

We wish you success with your research.

Yours sincerely,

Gail Wideman, Ph.D.
Vice-Chair, Interdisciplinary Committee on Ethics in Human Research

GW/th

copy: Co-Supervisors – Dr. Cecile Badenhorst, Dr. Tim Seifert, Faculty of Education
Director, Office of Research Services
Associate Dean, Graduate Programs, Faculty of Education

Appendix B

Endorsement letter from the Faculty of Education – MUN

MEMORIAL UNIVERSITY

Faculty of Education

Graduate Programs
St. John's, NL Canada A1B 3X8
Tel: 709 864 8553 Fax: 709 864 5379
www.mun.ca/educ

December 19, 2013

Office of Research and Development
University of Botswana

Dear Sir/Madam:

Seitebaleng Dintoe's doctoral research

This is to endorse Ms Dintoe's application for ethical clearance and research permit application from the University of Botswana. Ms Dintoe has submitted an ethics application of her proposed doctoral research titled 'Post experiences of technology among early adopters in the transition from classroom to print to online distance education materials: A case study of the University of Botswana' to Memorial University's Interdisciplinary Committee on Ethics in Human Research (ICEHR). Her application 20140915-ED was successful and constitutes her proposal. Both her supervisors, Dr Tim Seifert and I, have reviewed her proposal and recommend it for ethical clearance and a government research permit.

If you have any further questions, please contact me.

Yours sincerely,

Dr. Cecile Badenhorst
Assistant Professor
Adult/Postsecondary Education
Faculty of Education
Memorial University of NL
St John's, NL
Canada
A1B 3X8

Appendix C

ODR Approval Letter – University of Botswana

UNIVERSITY OF BOTSWANA

Office of the Deputy Vice Chancellor (Academic Affairs)
Office of Research and Development
Corner of Notwane and Mobuto Road, Gaborone, Botswana
Pvt Bag 00708 Gaborone, Botswana
Tel: [267] 355 2900 Fax: [267] 395 7573
E-mail: research@mopipi.ub.bw

Ref: UBR/RES/ETHI/1474
X-REF: UB/RES/ETHI/07

11 th Febraury 2014

Seitebaleng. S. Dintoe
Memorial University of Newfoundland and Labrador

RE: "PERMISSION TO CONDUCT RESEARCH WITHIN UB AND EXEMPTION OF RESEARCH PROJECT FROM RESEARCH PERMIT REQUIREMENTS

Project Title: **"Past Experience Of Technology AMONG Early Adopters IN The Transition From Classroom To Print To Online Distance Education Materials: A Case Study At The University Of Botswana".**

Researcher(s) : Seitebaleng. S. Dintoe

I am glad to advise that approval has been granted for the above study to be conducted at UB. Since the study is to be conducted within the confines of UB, the study has accordingly been exempted from Government Research Permit requirements. Before proceeding with the study, the researcher is required to ensure the following:

- **The study will only be conducted within the confines of UB following the approved proposal version.**
- **No interviews will be conducted with any official or individual outside UB as part of the study.**
- **Informed consent will be sought from all respondents**
- **Permission will be sought from UB authorities as necessary.**
- **APPROVAL DATE** :7th February 2014
- **EXPIRATION DATE** :This approval expires on 6th February 2015
  After this date, this project may only continue upon renewal. For purposes of renewal, a progress report should be submitted to ORD one month before the expiration date.
- **REPORTING OF SERIOUS PROBLEMS**: All serious problems impacting on study quality and progress (whether expected or unexpected) must be reported to ORD within 10 days.
- **MODIFICATIONS**: Prior approval is required before implementing any

Appendix D

Informed Consent Form

Title: The Past experiences of Technology among Early Adopters in the Transition from Classroom to Print to Online Distance Education Materials: A Case Study at the University of Botswana

Researcher(s): Seitebaleng Susan Dintoe, Doctoral Candidate, Faculty of Education, Memorial University, St. John's, NL. Canada. (709) 864-6928

Supervisor: Dr. Cecile Badenhorst, (709) 864-7654

You are invited to take part in a research project entitled *"The Past Experiences of Technology among Early Adopters in the Transition from Classroom to Print to Online Distance Education Materials: The Case Study at the University of Botswana"*.

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study at any time. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is the informed consent process. Take time to read this carefully and to understand the information given to you. Please contact the researcher, *Seitebaleng Susan Dintoe* if you have any questions about the study or for more information not included here before you consent.

It is entirely up to you whether to take part in this research. If you choose not to take part in this research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you now or in the future.

Introduction

My name is Seitebaleng Susan Dintoe, a doctoral candidate in the Faculty of Education at Memorial University. As part of my doctoral thesis, I am conducting research under the supervision of Dr. Cecile Badenhorst. In this study, I will be exploring early adopter's past experiences of technology in the transition from classroom to print to online distance education materials at the University of Botswana.

Purpose of Study

The purpose of this study is to explore past experiences of technology among early adopters in the transition from classroom to print to online distance education materials at the University of Botswana. To understand and explain this phenomenon, Rogers (2003, 1995), Diffusion of Innovation theory will be used as an analytical framework.

Procedures in the Research

There are two phases to this study. In phase one, I would like to collect information on one of your courses that you teach in these three delivery modes: classroom, print distance and online. I would like to collect all the documentation around these courses that you would be willing to share. I would also like to observe classroom interactions and with your permission, take photographs of classroom materials when the need arises. In phase two, I would like to interview you for about 40-60 minutes and, with your permission, tape-record the interview.

You will be asked questions that will also allow you to freely ask for clarification. Shortly after the interview has been completed, a copy of the transcripts will be sent to you to confirm accuracy and add or clarify any points that you wish to alter in order to gather the most accurate information possible. All the information will remain confidential. Your name will not appear in publications resulting from this study; however, with your permission, quotations may be used. No identifying markers will be used on these quotations and every attempt will be made to keep your identification anonymous. However, this is a small group in a closed community and it is possible that participants might be identifiable to other participants.

Length of Time

The interview will take 40 to 60 minutes to complete.

Withdrawal from the Study

You can decide at any time during or before the interview to withdraw from the study. You can withdraw (i.e. end participation) at any time during the data collection. When you withdraw from the study, let me know if you would like your data to either be removed and destroyed or retained and included in the research findings. It is only possible to remove data up to the approximate date of thesis submission and or publication (i.e. the specific date of the completed thesis after which I will not be able to remove the data).

Possible Benefits

While you may not benefit directly from this study, there are benefits across faculties at the University of Botswana. Once the research data has been analyzed, the results will inform University of Botswana and academic teaching staff on past experiences of individual influences in the transition from classroom to print to online distance education materials.

Possible Risks

There are no known or foreseeable risks. Though quotations will be used since this study is a qualitative study, your names or any identifying factors or references will not be used. Although all interviews will be private and conducted on a one-on-one basis, it is possible that participants might be identifiable to other participants upon any publication of my research, due to the small number in this study. However, I will follow ethical procedures to protect your confidentiality and anonymity. I will not release the participants' identity to anyone at the University of Botswana nor use any identifying names when analysing and reporting the study.

Confidentiality

Your name will be removed from the data to ensure confidentiality. Since I will be communicating face-to-face with you, you will be required to identify yourself. However, your identity will be kept confidential. Codes and pseudonyms will be used. However, since there is the possibility that participants may talk to each other and breaches in confidentiality may occur. I will do everything to ensure confidentiality when collecting data.

Anonymity

Direct quotations will be used in the report, since it is a qualitative study. Your identification will be kept confidential. There will be no identifying signs or markers. Pseudonyms will be used in this study. If this research is published or presented at seminars or conferences, you will not be identified in any form. I will make every effort to use short excerpts as quotations. Though anonymity might be a problem due to the small number of participants, I will try my best to protect your anonymity.

Storage of Data

The data collected from you will be kept safe and locked in a drawer. The data on the computer will be password protected and only accessible to my supervisor and me. The data will be retained for a minimum of five years, as required by Memorial University's policy on Integrity in Scholarly Research.

Recording of Data

I would like to tape the interviews with your consent and when need arises to take photographs of the classroom relevant to the study.

Reporting of Results

The data collected from this study will be used as material for my thesis, publications, and conference presentations. However, your identity will be kept confidential. Direct quotations will be used, but no identifying information will be used.

Sharing of Results with Participants

You may contact the researcher to obtain the results of this study. The contact information is provided below. It is hoped that the research will be published in peer-reviewed scholarly journals, presented at seminars, and conferences. The thesis will also be publicly available at the QEII Library.

Questions

You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact: Seitebaleng Susan Dintoe at ssd183@mun.ca and or my supervisor Dr. Cecile Badenhorst at cbadenhorst@mun.ca

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research (ICEHR) and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Consent: Your signature on this form means that

- You have read the information about the research.
- You have been able to ask questions about this study.
- You are satisfied with the answers to all your questions.
- You understand what the study is about and what you will be doing.
- You understand that you are free to withdraw from the study at any time during the data collection, without having to provide a reason, and that doing so will not affect you now or in the future.

If you sign this form, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Your signature

I have read what this study is about and understood the risks and benefits. I have had adequate time to think about this and had the opportunity to ask questions and to have my questions answered. Answer the following by writing 'yes' if you agree or 'no' if you disagree:

Yes/No _____ I agree to participate in the research project understanding the risks and contributions of my participation, that my participation is voluntary, and that I may end my participation at any time

Yes/No _____ I agree to be audio-recorded during the interview

Yes/No _____ I agree that my classroom materials can be photographed during classroom observations

Yes/No _____ I agree to the use of quotations but do not want my name to be identified in any publications resulting from this study.

A copy of this Informed Consent Form has been given to me for my records.

_____ _____

Signature of Participant Date

_____ _____

Researcher's Signature Date

I have explained this study to the best of my ability. I invited questions and gave answers. I believe that the participant fully understands what is involved in participating in the study, any potential risks of the study and that he or she has freely chosen to be in the study.

_____ _____

Signature of Principal Investigator Date

Appendix E

Letter to Participants

1. Letter to Participants

The Centre for Continuing Education
University of Botswana
Private Bag 005
Gaborone.

January 2014

University of Botswana
Private Bag 005
Gaborone.

Dear Academic Teachers

Request for Your Participation in this Study

My name is Seitebaleng Susan Dintoe. I am a doctoral candidate at Memorial University of Newfoundland, Canada, within the Faculty of Education, Department of Curriculum, Teaching and Learning Studies. One of the core functions of the university is research output and registered students are required to access research sites to conduct their thesis research. The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research (ICEHR) and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

I am writing this letter to solicit your support in the study "The Past experiences of Technology among Early Adopters in the Transition from Classroom to Print to Online Distance Education Materials: A Case Study at the University of Botswana". This study explores past experiences of early adopters educational technology at the University of Botswana. One of the requirements for doctoral studies is to do in-depth study of an area of my interest, and I have decided to explore my enduring interest in higher education particularly that of technology adoption.

I am specifically recruiting academic teaching staff who have been actively involved in the transition from classroom to print to online distance education materials at the University of Botswana. Those who are involved in these activities possess the professional knowledge and experiences fundamental for achieving the purpose of this study: which is to explore the past experiences of technology among early adopters in the

transition from classroom to print to online distance education materials at the University of Botswana. I am therefore seeking your support and participation in this study.

The study is done under the auspices of the University of Botswana, my sponsor and employer, and Memorial University of Newfoundland, in Canada, an academic research institution in which I am currently enrolled as a doctoral student. By contributing you will assist me in completing one of the requirements of my studies. In addition, I also hope to publish the study and thereby contribute to the body of knowledge on this area. If you wish to be informed of the results of the study, please contact me at ssd183@mun.ca

Participation in this study is voluntary. I highly appreciate your involvement. There are two phases to this study. In phase one, I would like to collect information on one of your courses that you teach in these three delivery modes: classroom, print distance and online. I would like to collect all the documentation around these courses that you would be willing to share. I would also like to observe classroom interactions with your permission, and take photographs of classroom materials when the need arises. In phase two, I would like to interview you for about 40-60 minutes and, with your permission tape-record the interview.

Be assured that all information that may lead to your personal identification will be held in strict confidence, it will be used only by myself, for tracking and follow-up purposes; it shall not be disclosed or released to any other person for any purpose. If I take photographs, they will be of classroom materials and not people. The sample size is purposively very small, consequently there is a possibility that participants may talk to each other and breach confidentiality. The data collected from you will be analyzed and reported or presented in conferences or published.

Thank you so much for your professional support and for the time that you will take participating in this study.

Yours sincerely,

Seitebaleng Susan Dintoe
Email: ssd183@mun.ca

2. Letter for Permission to Conduct Research: The Dean - Faculty of Education, Director – Center for Continuing Education and Head of Department – Department of Distance Education Unit, Office of Research and Development and Deputy Vice Chancellor Academic - University of Botswana

Center for Continuing Education
University of Botswana
Private Bag 0022
Gaborone.
January 2014
University of Botswana
Private Bag 005
Gaborone.
Attention:

Dear Sir/Madam

Request for Permission to Conduct Research

My name is Seitebaleng Susan Dintoe. I am a doctoral candidate at Memorial University of Newfoundland, Canada, within the Faculty of Education, Department of Curriculum, Teaching and Learning Studies, student number 200971687. One of the core functions of the university is research output and registered students are required to access research sites to conduct their thesis research.

I am writing this letter to solicit your support in the study "The Past Experiences of Technology among Early Adopters in the Transition from Classroom to Print to Online Distance Education Materials: The Case Study at the University of Botswana". This study explores past experiences of early adopters of educational technology at the University of Botswana. I am therefore kindly requesting that the academic teaching staff who are under your employment and supervision be allowed to be part of this study.

I have enclosed both a letter written to potential participants and the informed consent form that they are to sign. These documents provide more information about the study.

Your support in this endeavor is highly valued. If you have any questions please contact either myself or my supervisor at ssd183@mun.ca Tel: +1 709-864-6928 and cbadenhorst@mun.ca Tel: +1 709-864 – 7654, respectively.
Thank you.

Yours sincerely,

Seitebaleng Susan Dintoe
Email: ssd183@mun.ca

Appendix F

Interview Guide

CODE: _____

Time to interview: _____

Interviewer: _____

Place: _____

Date: _____

Gender: Male: _____ Female: _____ Year of Birth: _____

Current Position: _____

Number of years in position: _____

Your Faculty/Department: _____

Highest Degree obtained: _____ Specialty: _____

Date of Completion: _____

Teaching year started: Classroom: _____ Distance Education: _____

Course: _____Course: _____

Primary Research Questions

How do past experiences influence early technology adopters in the transition from the usage of print and online media in the classroom to the distance education delivery method?

Secondary Research Questions	Interview Guideline Questions
Q1. What are the characteristics, skills, and beliefs of early technology adopters?	Q1.1 Tell me more about yourself in the classroom and your distance education delivery teaching and your teaching at the University of Botswana?

	- How would you describe yourself transitioning from classroom to distance education? - What are the characteristics needed for a successful transition from classroom to distance education? - What skills did you have to use in this process? - Explain in detail how you used your skills. - What skills do you think are best for a successful process? - What are your beliefs in this process? - Can you explain in detail how your beliefs in educational technologies influence this process? Q1.2 You are involved in the classroom and distance education delivery at the University of Botswana. How do you use educational technologies to facilitate this process for teaching and learning? - How would you describe yourself using print and online in the classroom and distance education delivery? - Describe in detail how your experiences influenced this process? Q1.3 How do you think the University of Botswana's experiences influenced your transition process. - What things motivated or discouraged you as you started to teach at the University of Botswana? Q1.4. When making the decision to use your conventional skills in distance education, were you pressured in any way to do so? - By administration? other professors? - Or was it your decision alone? - Explain in Detail. Q1.5 What influenced your decision to adopt or reject the innovation of f2f to distance

	education teaching? (probe for individual personal, social environmental, and compatible perspectives).
Q2. What are the challenges faced by early adopters as a classroom and distance education lecturer?	Q2.1 In this question I would like you to describe in detail your experiences of moving from the classroom to distance education: - What are your experiences of classroom teaching? - When did you start teaching face-to-face courses? - What do you like most about this work? - What did you find challenging? - What tasks were rewarding? - Can you explain the type of educational technologies you use to enhance conversional teaching and learning? Q2.2 Describe in detail the type of media you use. - Where did you get support? - What type of support did you get? - How did you make use of the support? - What was your role when supported? Q2.3 Talk about your pedagogical experiences in traditional teaching. - Explain how you develop the learning materials based on your experiences. - What role did you play in the development of learning materials? Q2.4 What are your experiences of teaching distance education courses? - When did you start teaching distance education courses? - What do you like most about this work? - What did you find challenging? - What tasks were rewarding? - Can you explain the type of educational technologies you use to enhance distance education teaching and learning?

	Q2.5 Describe in detail the type of media you use in distance education. - Where did you get support? - What type of support did you get? - How did you make use of the support? - What was your role when supported? Q2.6 Talk about your pedagogical experiences in distance education teaching. - Explain how you develop the learning materials based on your experiences. - What role did you play in the development of learning materials? Q2.7. Tell me about any other experiences using print and online in the classroom to distance education delivery methods? - What were the advantages and disadvantages? - Why do you think you have made this transition? - What did you find most challenging in this process? - What were your roles in this process? What do you think should be done to facilitate the transition process?
General Questions	Q13. Maybe I left some important information that you think should have been asked, please feel free to ask questions or explain your suggestions concerning the transition process you went through. - What else do you want to share with me on your educational technology experiences transitioning from classroom, to distance education using print and online medias?

Appendix G

Observation Tool for Face-to-Face and Sessional Distance Education

Tutor	**Course Code**	**Course Name**	**Duration**	**Date**
What to Observe				
1. Activities				
2. Technologies: - Print - Online				
3. Intervention				
4. Skills				
5. Advantages Disadvantages				

Appendix H

Faculties and Departments Offering Courses f2f to Distance Education - Purposeful Sampling Guiding Tool: Participants

Faculty	Departments	Courses	Instructors	Classroom yes/no	Print/Online Media Yes/No	Distance Education yes/no
Business	Accounting Finance Management Marketing	Yes	Yes	Yes	Yes	Yes
Education	DAE NGO Primary Education Humanities	Yes	Yes	Yes No Yes Yes	Yes Yes Yes Yes	Yes Yes Yes No
Engineering and Technology		Yes	Yes	Yes	Yes	No
Health Sciences		Yes	Yes	Yes	Yes	No
Science		Yes	Yes	Yes	Yes	No
Social Sciences		Yes	Yes	Yes	Yes	No
Research And Development		n/a	n/a	n/a	n/a	n/a

Appendix I

An Example of Coding During and After Interview Transcriptions

Keywords Open Coding: Verbatim – Categories: Interview Transcripts	Categories (Axial Coding)	Selective Coding – Themes
Keep on improving in accordance with the University of Botswana Teaching and Learning Policy		
	Teacher development	Faculty development
Encourage the staff to adopt specific teaching style		
Classrooms are equipped with this technology		
	Use of technology in the classroom	Implementation
Level of drop outs in the distance mode is high compared to the conventional system	Faculty roles	The use of Educational Technology from classroom to distance education
University does not provide facilities for distance education		
	Lack of Facilities in the University of Botswana	The decision to diffuse an innovation in the transition process
I give them theory and demonstrate the concepts on the computer		
	Method of teaching in the university	
It was a self-taught kind of thing		

I was teaching the same course in the full-time program	Innovative lecturers	
I make sure that 50% is theory and 50% is practical		
My experience in teaching has been face-to-face		
Approach to teaching is that, you know the best way to learn is hands on	Experience in the transition process	
Challenges in distance education are organizational or logistic		Organizational, technology, and individual factors
I do not use this modern technology		
Maybe I am old school and feel face-to-face personal interaction		
I use blended learning		
I put information online using Backboard		
Remote areas cannot access internet		

Their cellphones did not have internet Communicate or give them extra information I use the module for teaching distance education learners Students do not really use what is posted on the Blackboard I started off as a Secondary School teacher The government was pushing people towards teaching I inform my teaching through research Problem of English as a second language I give students handouts, use PowerPoint, videos, YouTube videos The computers in the university are not enough	Demographic and background information Communication Teaching and learning materials Time Factor	

I need more time with distance learners Module honestly cannot have one text Educational Technology Unit run workshops to be attended by anyone I am employed to teach face-to-face and distance education is on part-time basis Print, we are talking of using a lot of paper and toner Online document can be sent to several people Workload, constantly responding Link students to other resources More teaching than lecturing Overwhelmed by work	Researcher Planning and organization: Time Support from University of Botswana Reflective Actions The policies binding lecturers	Demographic Profiles Planning and Organization

	Challenges of print and online medias Teacher-centered Workload in the transition process	Challenges in the Transition