Integrating e-Learning in Open and Distance Learning: The Case of Botswana Open University

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Abstract

The Botswana College of Distance and Open Learning (BOCODOL), presently Botswana Open University (BOU), was founded to provide nation-wide learning opportunities for out-of-school young adults using the Open Distance Learning (ODL) mode. The BOU used a number of strategies to enable it to deliver on its mandate; one such strategy being the implementation of e-Learning, following contemporary delivery trends internationally within the ODL field. This paper reports on the findings of a study that sought to investigate the extent to which organisational efforts (means) were able to produce organisational results (ends) and associated societal impact in e-Learning implementation at BOCODOL. The diffusion of an innovation theoretical framework and Organisational Elements Model (OEM) conceptual framework was used to underpin the study. Qualitative data collection methods of inquiry (ethnography, document analysis and written interviews) were used. After providing a relevant literature review, the paper firstly reports on the Botswana e-Learning landscape, as well as the nature of inputs and processes serving as means to e-Learning implementation at BOU. Secondly, it reports on the products, successes and challenges as well as outputs and outcomes during e-Learning implementation at BOU. The methodology and findings of the study directing this paper are discussed, and lastly, the paper acknowledges the impact of organisational results (outputs and outcomes) encountered during e-Learning implementation and their implications to the ODL field.

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Introduction

Higher Education Institutions (HEIs) continue to experience increasing pressure to adopt e-Learning as a way of facilitating teaching and learning. This requires institutions to introduce strategies and policies that implement flexible academic frameworks, innovative pedagogical approaches, institutional collaboration in the development and delivery of learning material, and, most crucially, commitment to the equivalence of access for students (MacKeogh and Fox 2008). Emerging trends indicate that many students today are making increasing use of web-based technologies in their daily lives (An and Williams 2010). However, while these technologies are fast becoming accepted by HEIs, and are useful in the lives of students, they are still new to a majority of instructors.

It is a common feature that the adoption of any new technological innovation by any organisation or social system, such as academic institutions, will be governed by prevalent theories regarding the diffusion of innovations such as the one by Rogers (2003). BOU, being a social system, is also bound to be affected by such a theoretical framework and the inherent factors that influence the diffusion and adoption of new innovations such as e-Learning. One would have to conduct an extensive research study to establish the extent to which e-Learning innovation has progressed in the institution. This paper reports on the findings regarding the extent to which the initiatives embarked upon to integrate e-Learning into the learning culture of BOU, have been achieved, and the implications for ODL having been established. The paper is part of a broader empirical comparative study that investigated e-Learning provision at two major government institutions in Botswana (i.e., University of Botswana and Botswana Open University) (Tladi 2016).

BOCODOL was created through an Act of Parliament in December 1998. Its creation marked a milestone in the development of education in Botswana, and a significant step towards realising Botswana's Vision 2016 and 2036 (Government of Botswana 2016), which emphasises the elimination of poverty through the provision of knowledge and skills (Government of Botswana 1997 and 2016). The case for establishing a semi-autonomous distance learning college was pronounced by the Revised National Commission on Education (RNPE) in 1993 (Recommendation number 87) as approved by the National Assembly in April 1994 as part of the RNPE during 1994 (Government of Botswana 1994). BOCODOL, which has now been transformed to Botswana Open University (BOU), during 2019, was formed to improve access to learning opportunities on a nationwide scale for out-of-school young adults. Open learning sought to break down the barriers to personal development by providing flexible learning environments. As a distance learning institution, it would be of great benefit to its learners (both existing and potential) to have access to the latest technological innovations, hence the need for the college to explore the implementation of e-Learning in its development and delivery of courses.

An e-Learning mode provides teachers and learners with a dynamic resource in terms of content for supporting curricula. The goal for educators is to get learners motivated and engaged in active and participatory learning experiences. E-Learning is, therefore, intended to serve as an instructional medium that generates excitement in the learning process. The more interactive and engaging the material is, the more learners will enjoy it, learn from it and retain information from the lessons. E-Learning also provides learners with rich and flexible media that offer them an opportunity to revisit content if they have not been able to understand it the first time, to ensure that they understand concepts they might have missed. The other advantage or usefulness of e-Learning is that it offers curriculum developers, teachers and learners access to a number of free and open online resources, including Open Educational Resources (OER) and Open Source software that can be adapted and adopted at no cost for the benefit of learners. This is one of the driving principles that BOU has actually adopted to improve access to learning opportunities; an initiative that the college approaches in a variety of ways, as shall be explained later. The purpose of the paper is to report on the findings of a study regarding the extent to which BOU's organisational efforts (inputs and processes) were able to produce organisational results (products and outputs) and associated societal impact (outcomes). The following research questions guided the investigation of e-Learning implementation at BOU:

- What inputs and processes served as means to e-Learning implementation?

- What products, successes and challenges resulted from e-Learning implementation?

- What organisational results (outputs) and societal impact (outcomes) were encountered during e-Learning implementation at the institution?

Relevant Literature

A review of relevant literature was conducted to provide the context of e-Learning implementation internationally and in Botswana, with a special focus on BOU. The literature search is documented in this section under selected headings relevant to the context of the paper.

E-Learning and Open Distance Learning

Open and Distance Learning (ODL) is one of the most rapidly growing fields of education in recent times. It has experienced remarkable growth in national and international education spheres since the early 1980s (Oladejo and Gesinde 2014). Research has shown that "Africa has had a long history in adopting distance education and technology in education, and today, there are over 140 public and private institutions offering distance education in Africa" (Murphy et al. 2002). Current trends more than ever indicate that ODL will be an important element of future education and training systems. This view is supported by Mathew and Iloanya (2016), who opine that many African universities are on the verge of adopting increased usage of technology

to increase access and effectiveness of their ODL offerings. E-Learning has been adopted as a major innovation used by most HEIs world-wide.

There are many operational definitions of e-Learning that have been coined. Kok (2010) defines e-Learning as interactive learning in which the learning content is available online and provides automatic feedback to the learning activities. BOCODOL, on the other hand, defines e-Learning as "the use of electronic devices to develop and deliver interactive multimedia educational materials, information and content to the learner to enable active participation and interaction between the learners and the instructor to facilitate the teaching and learning process" (BOCODOL Strategy 2012–16). In a nutshell, e-Learning is about the use of contemporary instructional technologies, especially digital and network technologies, to create, foster, deliver, and facilitate learning, anytime and anywhere. Some of the archaic instructional technologies are no longer as versatile as the newer blends, although they are still popularly used as ODL modes of delivery of instruction (i.e., print, radio, instructional television, and so forth). Simulations and games have also often been referred to as technologies of instruction, as they are very powerful interactive tools, especially in instructional settings focusing on affective domain objectives. Gaming or gamification has recently gained much popularity in teaching and learning, for both education and industry. These prevalent definitions of e-Learning should, therefore, be viewed as coined for specific purposes and are not necessarily inclusive of the entire range of modes of instructional technologies.

The education sector has no doubt realised that technological evolution itself has a role to play as far as e-Learning developments and ICT uptake in general are concerned in teaching and learning. Over the last 30 years, computers and other ICTs have increasingly been adopted for use in ODL programmes, particularly at the tertiary level (Du Vivier 2009). ODL is a mode of delivery commonly used by out-of-school youth and adults to undertake learning as they strive to improve their qualifications and also acquire new skills as a way of improving their lives (Naidu 2006). According to UNESCO, ODL is fast becoming an accepted and indispensable part of mainstream educational systems, both in developed and developing economies (UNESCO 2002). In most developing countries, especially in the rural areas, this at times might be the only available option for learners to access any form of training, as they normally would have very little or no time to attend school due to various social commitments, provided there is a functional ICT infrastructure available and accessible to them. Rena (2008) has argued that there is a need to establish some basic understanding of the mechanisms of implementing ICT and its role in improving the lives of society. This would require focusing on issues relating to the environment within which a community exists, local circumstances surrounding them and differences of culture. Istrate (2009) concurs with this view by stating that effective e-Learning comes from using ICT to broaden educational opportunities and help students attain the level of development they and their countries need to thrive in the 21st century.

When considering the introduction of ICTs to ODL, for example, one needs to be mindful of the fact that new instructional technologies, if not infused in an appropriate way, can hinder access and become an impediment to open learning, especially when the target group is not familiar with, or let alone comfortable with, technology. However, it is important to also note that e-Learning is not only about computers, but it is also about using other multimedia technologies available in our day-to-day lives, such as print, television, audio cassette and radio. These technologies, when utilised properly, can go a long way in facilitating adult learning, as they are more familiar and user friendly to adults, who are predominantly ODL recipients. Taking advantage of this technology would improve the performance of learning at a distance, as they help to further complement the lack of face-to-face contact in programme delivery. In an attempt to transform teaching and learning, educators in diverse contexts are exploring innovative ways to use web technologies in teaching and learning (An and Williams 2010).

Botswana e-Learning Landscape

In many developing countries, e-Learning initiatives are haphazard and uncoordinated, mainly because there is normally no clear policy guiding such initiatives. It is, therefore, critical for countries to create national policies in line with Information and Communication Technologies (ICTs) to serve as strategic roadmaps to ensure consonance of efforts towards ICT infrastructural developments and e-Learning development. The main challenge is, and has always been, making sure that media and internet centres are available to all (even after hours, including weekends) for teachers and learners to access available online resources. In the case of Botswana, the government has developed a policy specific to the development and implementation of ICT across all sectors of the economy. The Botswana National ICT Policy (Republic of Botswana *Maitlamo* 2007) was developed in 2004 and approved by parliament in 2007; it is currently being implemented in the various sectors of the economy. Out of this policy also came the National e-Learning Strategy and the formation of the National e-Learning Steering Committee (NELSCOM) to spearhead and steer e-Learning initiatives in the country (Botswana National ICT Policy, Republic of Botswana *Maitlamo* 2007). Based on the e-Learning landscape in Botswana, there could be some degree of insufficient understanding of what e-Learning really is, and the potential it has to transform the teaching and learning process in Botswana's education system. NELSCOM was responsible for bringing together all stakeholders in the e-Learning initiative, across all sectors responsible for creating a conducive environment for e-Learning implementation in the education sector. NELSCOM membership included policy makers, Information Technology (IT) specialists, as well as educationists and educational management specialists.

The Government of Botswana has also put in place a number of ICT initiatives, which when taken advantage of, can assist the country in achieving significant progress towards the implementation of e-Learning, especially towards delivery and support of teaching and learning in ODL. Some of these initiatives include the following:

1. **Schools' computerisation:** This is a fully sponsored government project to provide ICT infrastructure to all schools. So far, all junior and senior secondary schools have been provided with a computer laboratory, each with 20 computers.

2. *Kitsong* **Centres:** This is a Ministry of Science and Technology project to provide ICT service centres in villages around the country through post offices. These centres provide a number of combined services to the general public, ranging from communication, photocopying and internet services (Kgokgwe 2003).

3. *Sesigo* **Project**: This is an African Comprehensive HIV/AIDS Partnership (ACHAP) and Bill and Melinda Gates partnership with local libraries to provide internet connectivity to facilitate online access to HIV/AIDS information to the society throughout the National Library Service system. Some of the key activities and services provided at these centres include:

   - Basic computer training for all learners and the public.

   - Training on ways to use e-Learning technologies in order to enhance teaching and learning, especially in the school system.

   - Internet access/connectivity for all.

   - Supporting students and parents who want to use internet technologies to search for information and access government services (Kgokgwe 2003).

The Government of Botswana has also made investments in the international telecommunication industry, such as the East African Submarine System (EASSy) and West African Cable System (WACS) fibre cables to provide connectivity to the outside world at reasonable prices. The EASSy and WACS projects are expected to transform the telecommunications landscape in the country, as they will improve access to faster internet connectivity and substantially reduce the costs for consumers and businesses, including the education sector. According to the World Economic Forum (WEF) 8th Annual Global Information Technology Report of 2008–9, Botswana was ranked 77th in the world and 3rd in Africa in terms of the Global Networking Readiness Index (World Economic Forum 2009). Botswana's ranking on fixed broadband internet tariffs improved from 118th position (out of 138 countries) in 2011, to 103rd position (out of 142 countries) in 2012. The latest WEF rankings (2013–2016) indicate very minimal variations in position for both the world rankings and in Africa, as shown in table 1.

Table 1: The Network Readiness Index for Botswana (2013–2016)

Year	World Rankings	Position in Africa	Index Score	Total No of Countries
2013	96	7	3.5	144
2014	103	8	3.43	148
2015	104	9	3.4	143
2016	101	8	3.5	139

The 2015 Botswana readiness sub-index overall ranking was position 116, while the component pillars of infrastructure, affordability and skills, were ranked 114th, 131st and 89th respectively in the world out of 143 countries. In the 2016 rankings for the same categories, Botswana attained position 111 overall, while the component pillars of infrastructure, affordability and skills, were ranked 95th, 125th and 87th respectively in the world out of 139 countries. On the other hand, in the 2015 usage sub-index the overall position attained was 92, while in the component pillars of individual usage, business usage and government usage, Botswana was ranked 85th, 102nd and 81st respectively. In the 2016 usage sub-index the overall position attained was 96th, while in the component pillars of individual usage, business usage and government usage, Botswana was ranked 94th, 96th and 89th respectively. These results indicate an improvement in readiness as the country moved upwards from position 116 to 111. However, the situation is different for the usage sub-index, where the results indicated a drop from position 92 to 96 overall, even though the readiness had improved.

Over the years, the Government of Botswana has made huge investments in the ICT sector towards infrastructure development to facilitate easier access to the internet for its population. Recently, the government invested hugely in the undersea fibre optic cables linking Africa to Europe, the East Africa Sub Marine System (EASSy) and West Africa Cable System (WACS). These government initiatives saw an increase in the national internet capacity and cheaper internet connectivity to Botswana at an average price reduction range of 25–40% for end users. According to *Mmegi Monitor Newspaper* (10 September, 2012), the WACS project was designed to support present and future internet, e-commerce, data, video and voice services. The paper indicated that effective from 1 August 2012, BTC slashed its wholesale internet bandwidth prices by 59%.

Wholesale internet bandwidth prices/tariffs declined over the years from 2011 until March 2017, as indicated earlier. This downward trend was expected to continue with both mobile and Asymmetric Digital Subscriber Line (ADSL) internet services' pricing going down in keeping with international trends. According to Botswana Communications Regulatory Authority (BOCRA 2014), the decline in wholesale internet bandwidth prices was influenced by the acquisition of internet bandwidth capacity through the EASSy and WACS undersea cable systems (BOCRA 2014). These

developments continue to improve access for the Botswana population by making it cheaper for more people to afford connectivity costs.

The Botswana, government has embarked on a drive to go beyond the mere reduction of poverty, but shifting its focus towards poverty eradication using ICTs as one of its efforts towards achieving the Sustainable Development Goals (SDGs) as a follow-up of the Millennium Development Goals (MDGs) agenda. Projects such as *Nteletsa, Sesigo, Kitsong* and schools computerisation are but a few that have been implemented by the government towards promoting technology usage by all. It would be to the advantage of all Batswana, if e-Learning could be enhanced to help the country drive forward this initiative by making technology accessible to all for purposes of teaching and learning, as well as national service delivery towards achieving its goal of improved quality of life.

In Botswana, this would also be in line with the goal of achieving "an educated and informed nation" as enshrined in the national long-term vision of Botswana, Vision 2016 and 2036 "Towards Prosperity for All." However, the *Nteletsa* project seems not to be working as expected, with many established centres having collapsed due to a lack of proper management. The *Sesigo* project in libraries and *Kitsong* Centres in post offices are working well. The schools' computerisation project is ongoing with supervision from the Ministry of Basic Education through the *ThutoNe*t project. In addition, the *Mascom Kitsong* Centres are also in operation, as the concept of their establishment was for persons to be identified and trained to run the centres under the *Nteletsa II* Rural Development Project in 2009, where coverage then was extended to 41 villages and *Kitsong* Centres set up in those villages. Upon realising the need and potentially the life-changing effects of this project, *Mascom* continued on this initiative and set up more *Kitsong* Centres. There are now a total of 105 *Kitsong* Centres in 105 villages across Botswana, and over 25 million was invested in the project.

These are welcomed developments for the education sector, as they offer Botswana tertiary institutions opportunities to integrate e-Learning components in online instructional material provision. These government initiatives have seen an increase in the number of internet service providers and public access points through internet cafes as well as connections at home. These developments also increase the potential for the growth of e-Learning initiatives at different levels of the education sector for the potential future benefit of the economy.

Methodology, Theoretical and Conceptual Framework

This part of the paper provides aspects of the methodology adopted in the relevant study, as well as the identified theoretical and conceptual framework underpinning the study.

Methodology

An interpretive (qualitative paradigm) was used to inform the design of the study. According to Creswel (2005), an interpretive paradigm involves using people's experiences to inform findings as their experiences form the essence of what is real to them. A qualitative case study research design was found to be more appropriate, augmented by document analysis. The study also used some aspects of triangulation, as some quantitative data were used to complement the qualitative data source. BOCODOL was the main unit of analysis. Potential respondents of the study were members of staff as well as learners enrolled in various tertiary programmes of BOU and staff involved in the delivery and support of these programmes. A written interview, targeting e-Learning specialists at BOU, was conducted to collect more detailed information. The paper reports data acquired from the qualitative component of the study (i.e., written interviews as well as document analysis). The written interviews targeted e-Learning specialists at the institution, so as to collect more detailed information about their perceptions, attitudes, feelings and experiences on e-Learning. Some excerpts from written interviews are provided in the paper to complement the document analysis data source.

Theoretical Framework

According to Rogers (2003), "there exist four main elements that influence the spread of a new idea: the innovation, communication channels, time, and a social system." These elements interact in some complex manner to influence the degree and level of adoption and use of any new innovation by a group of people. According to Rogers (2006), the categories of adopters in a new innovation are: innovators, early adopters, early majority, late majority, and laggards. The Diffusion of Innovation Model is a theory that attempts to describe how, why, and at what rate innovations spread through an institution. The model therefore identifies five critical categories of innovation adopters during the diffusion of new innovation.

The process resembles a bell-shaped curve showing innovators in the extreme end of the distribution, who only make 2.5% of the organisation. Innovators are those who take risks and pioneer the adoption process in its early stages. The next group of early adopters wisely adopts the innovation and becomes that group with whom the rest of the members in the organisation consult for specialist information and advice (Rogers 2003). As role models, this group's attitudes toward the innovation are more important and their subjective evaluations about the innovation reach other members of the organisation through interpersonal networks. It is for this reason that e-Learning specialists were selected for written interviews conducted for the study. Early adopters' leadership in adopting the innovation decreases uncertainty about the innovation in the diffusion process, as shown in figure 1
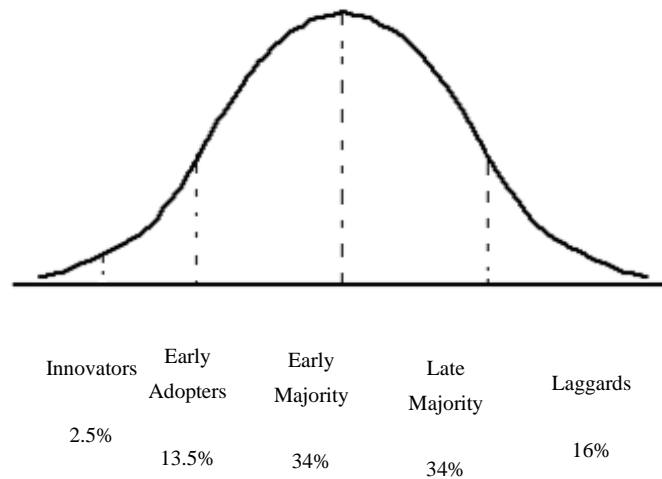
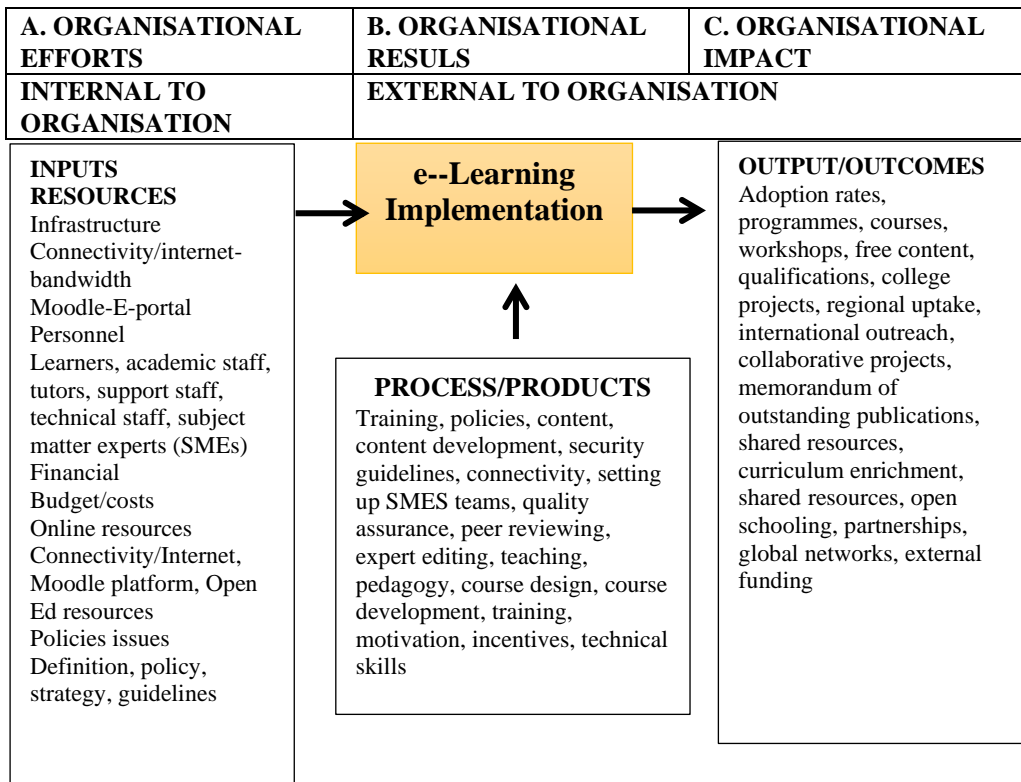**Figure 1:** Diffusion of Innovation Model (Rogers 2003)

Early adopters make up 13.5% of the group, and the group that follows (early majority) makes up 34%. Members of this group have good interaction with other members of the organisation; they are conscious of adopting innovation and their decision usually takes more time than it takes innovators and early adopters (Rogers 2003).

The next group (which makes up 34%) is the late majority, that adopts an innovation but with a great deal of scepticism and only if pressured by necessity. The last group (i.e., laggards) resists adopting an innovation until rather late in the diffusion process, if ever. Thus, laggards tend to decide after looking at whether the innovation was successfully adopted by other members of the organisation in the past. This group makes up 16% of members within the organisation. It is the late majority and laggards that are worrisome, since together they make up 50% of the members in the organisation. Even though the model to some extent provides a considerable explanation of how technology adoption would occur in an organisation, it has some limitations.

This model to some extent provides the theory that constitutes a general theoretical framework, which describes either adoption or non-adoption of technology by organisations. However, the theory operates under the assumption that lecturers adopt technology to take full advantage of their usefulness; and does not take into account other underlying factors, which might influence adoption or non-adoption, such as contexts and domains; it does not explain how this may or may not be related to other reasons (MacVaugh and Schiavone 2010). People may adopt a new technology just because they see others doing it, hence, maximising their social orientation. The resulting conflict of assumptions means that the model is context dependent rather than generally predictive (MacVaugh and Schiavone 2010).

Conceptual Framework

The conceptual framework of the study is guided by the Organisational Elements Model (OEM), which relates means and ends, resources and results, tools and objectives, techniques and tasks (Kaufman and Thiagarajan 1987). The OEM has five organisational elements (inputs, processes, products, outputs and outcomes). Four of these are internal to the organisation, while the outcomes are external. The paper has adopted and adapted the OEM for purposes of evaluating the outcomes of e-Learning implementation at BOU. The model enables the investigation to assess the results of the organisational efforts, and to describe how inputs and selected processes deliver products and outputs as illustrated in the conceptual framework provided in figure 2.

A. ORGANISATIONAL EFFORTS	B. ORGANISATIONAL RESULS	C. ORGANISATIONAL IMPACT
INTERNAL TO ORGANISATION	EXTERNAL TO ORGANISATION	

| INPUTS RESOURCES
Infrastructure
Connectivity/internet-bandwidth
Moodle-E-portal
Personnel
Learners, academic staff, tutors, support staff, technical staff, subject matter experts (SMEs)
Financial
Budget/costs
Online resources
Connectivity/Internet, Moodle platform, Open Ed resources
Policies issues
Definition, policy, strategy, guidelines | **e--Learning Implementation**

PROCESS/PRODUCTS
Training, policies, content, content development, security guidelines, connectivity, setting up SMES teams, quality assurance, peer reviewing, expert editing, teaching, pedagogy, course design, course development, training, motivation, incentives, technical skills | OUTPUT/OUTCOMES
Adoption rates, programmes, courses, workshops, free content, qualifications, college projects, regional uptake, international outreach, collaborative projects, memorandum of outstanding publications, shared resources, curriculum enrichment, shared resources, open schooling, partnerships, global networks, external funding |

Figure 2: Putting together the conceptual framework of the study using OEM aspects

When implementing an instructional technology such as e-Learning, where resources are used (inputs) to deliver instruction or other services (processes), we look forward to the results (outputs). The two types of results within organisations are: a) learner and instructor accomplishments; and b) total system (or organisational) accomplishments.

Summary Results, Discussion and Impact

The section that follows provides a summary of findings and some guided discussion based on the three major research questions, and is also aligned to the OEM framework identified for the study. Some excerpts from the respondents, including members of staff, students and e-Learning specialists, are also integrated with the discussion to provide qualitative evidence to the research questions as presented below.

What Inputs and Processes Served as Means to e-Learning Implementation?

The infrastructure and services provided by the government offered an opportunity for BOU to venture into e-Learning as early as 2006. In its 2012–16 Strategy, one of its values was, "Technology is our Engine of Success." BOU staff members shared their views on the issue as expressed in the verbatim comments below:

> **Excerpt** 1: "Infrastructure needed costs—a lot of money to set up."

> **Excerpt** 2: "There is an increasing range of ICTs equipment as technology keeps changing and it costs money to keep up with new technology."

In the BOCODOL strategy (BOCODOL Strategic Plan 2016–20, 19), there are specific strategic objectives within the strategy document focusing on harnessing technology to increase its use in course content as well as by the institution, learners, tutors and staff. Over the years, the college has embarked on a number of e-Learning initiatives in the form of projects and/or partnerships. On the issue of policy, respondents were of the view that the institution did not have a clear policy that could be used to guide the proper implementation of e-Learning. Below are some of their comments:

> **Excerpt** 3: "There is no policy per se but there are clear guidelines on how to develop online courses. A draft e-Learning strategy has been developed to mitigate the absence of an e-Learning policy."

> **Excerpt** 4: "Not yet. The policies are still at the development stage."

> **Excerpt** 5: "The institution is benchmarking policy with others which already have e-Learning."

The initial e-Learning initiative was in 2004, with the aim of converting at least two of its existing courses into the e-Learning mode as a pilot project. An open source option, *Moodle,* was chosen for trial purposes and its main challenge was a lack of technical expertise in the area of programming to configure the software within a server environment. The institution eventually secured assistance from an e-Learning technical assistant at the Francistown College of Technical and Vocational Education (FCTVE) to configure *Moodle*. According to one of the e-Learning specialists, this collaboration with FCTVE provided the much-needed impetus to launch the BOU e-Learning

initiative. He further indicated that their experience has shown that *Moodle* was user friendly, with features that are well outlined and easy to navigate.

In September 2006, the college embarked on a project to pilot the use of technology in the provision of learner support services. The pilot project involved the use of internet and e-mail services to provide assistance to a group of 25 open schooling learners, who were identified by the BOCODOL Gaborone region. These learners were provided with some basic training in the use of computers and the internet and it was expected that the learners would access internet services through locally available internet cafes. However, this project was not successful due to the prohibitive costs of internet café rates. The target group comprised unemployed secondary school learners unable to raise enough funds for connectivity. Feedback received from the learners on this project indicated that they were of the view that the institution did not have adequate resources to support them. Below are a few excerpts from the student responses to support this view:

> **Excerpt** 6: "The institution has fewer resources to facilitate e-Learning, the issue of internet access is a problem."

> **Excerpt** 7: "The institution does not have necessary resources to facilitate e-Learning implementation. Only the human resource is available."

The Gaborone region embarked on yet another similar project for a group of diploma learners to submit assignments online instead of undertaking frequent visits to the study centres (SCs). E-mail addresses were set up for learners to use to submit assignments. The initiative was well taken up by learners and the college resolved to explore the possibility of extending it to other regions on a pilot rollout basis. During the rollout process, it became apparent that the college needed the services of a technical person to take responsibility for e-Learning initiatives, providing staff and students with the necessary technical user support. To facilitate implementation, the college then recruited a technical officer (TO) for e-Learning in October 2008. Furthermore, the coordination of all e-Learning implementation initiatives was placed under the mandate of the department of Multimedia and Production, established in 2007.

During 2009, BOCODOL undertook yet another pilot project on the use of mobile technologies, using Short Messages Service (SMS) to disseminate information to a group of Small Scale Business Management (SSBM) learners. An evaluation survey was conducted on the pilot project. The results indicated that 51.7% of the learners rated the service good and above; 23.6% rated it average; only 15.9% rated it poor; and the responses of about 8.8% could not be traced. The results show that a significant majority of learners were happy with the service. About 73 (72.9%) of the learners found the service useful; only 18% reported not finding it useful; with 9.1% of the responses that could not be traced. The pilot results also indicated that the majority (90.8%) of learners wanted the service continued, with only 3.6% reporting against it. About 91.8% of the learners wanted the service extended to other programmes, with only 4.1% against it.

At the national level, Botswana has taken significant strides in providing an enabling environment through the provision of relevant strategic policies and technological infrastructural developments, as reflected in *Maitlamo* ICT policy, *Thuto*-Net and the establishment of e-Education committees to steer e-Learning development and implementation throughout the entire education sector. However, while strategic policies deal with the substance of e-Learning at BOU, operational policies should deal with processes of getting e-Learning implementation done. The findings show that an e-Learning strategy and definition to guide the process were in place, but no policy was in place at the time of conducting the study. The findings also show that e-Learning specialists suggested that staff (lecturers and tutors) required more training to equip them with the necessary skills to enable them to deliver better results on e-Learning. The findings further suggest that critical inputs such as resources were not adequate to support e-Learning.

What Products, Successes and Challenges Resulted from e-Learning Implementation?

Overall, there was overwhelming evidence that e-Learning service was of great value, not only to learners, but to the entire institution, and should be extended to include more programmes and services. Following the success of the e-Learning pilot project, BOCODOL took a decision to expand the use of SMSs to also include areas outside academic support services, such as financial services, as this would enable the college to send reminders to students on the status of their accounts. The e-Learning initiative at BOCODOL has had some successes and challenges over the years since its inception. One of the major positive achievements of the *Moodle* project was that to date, BOCODOL has been able to start the delivery and support of the Certificate for Distance Education Practitioners (CDEP) to a number of learners across the Southern African Development Community (SADC) region, including Botswana, Mozambique and the Democratic Republic of Congo (DRC), thus transcending boundaries. Currently, the *Moodle* e-Learning e-portal has 867 users, including learners, tutors and members of staff. To date, the e-portal has seven programmes running on the *Moodle* platform, ranging from diploma to master's level. However, there is a need for improvement to the provision of a separate line, as well as a portal readily available to students at all times, as articulated by a specialist respondent in the excerpts:

> **Excerpt** 8: "We need to have a separate dedicated line for e-Learning separate from the general administration line."

> **Excerpt** 9: "Training and recruitment of staff with the necessary skills need to be done."

Some successes of using *Moodle* are that, firstly, the college has realised that making course material available on the platform has reduced the printing budget for the college, as all the materials are downloaded from the portal. Secondly, the use of *Moodle* to facilitate access to course content and the provision of other online services to learners have also increased the use of online facilities of the college due to *Moodle*'s user

friendliness. Learners were able to participate in other interactive course activities such as discussion forums and scheduled chat sessions. Additionally, learners are now also able to submit assignments online without the need for them to physically travel long distances to college facilities to submit these, which was costly for most of them. These observations have also been corroborated by feedback from learners, as captured in the excerpts below:

Excerpt 10: "The software is very user friendly because the features are universal."

Excerpt 11: "E-Learning courses are more convenient because you can learn anywhere, you do not have to be in class."

Excerpt 12: "As long as they are taken through the platform, they find it exciting to use it because it is very interactive."

Excerpt 13: "Need for development of interactive material."

Along the way, there were also challenges encountered during the e-Learning implementation process. The most significant challenge was resistance by academic staff to embrace the use of this new platform, as most felt it was creating unnecessary extra work for them. Nonetheless, there were some—though few initially—who took up the opportunity at the first go (early adopters), such as the CDEP programme staff, and they were willing to be pioneers of e-Learning within the institution. Their opinions, as captured in their responses below, indicate that they were of the view that staff members were well prepared for the initiative.

Excerpt 14: "Staff are trained and equipped with the necessary skills but they do not own-up to the initiative."

Excerpt 15: "Ownership of e-Learning should be by all staff, including college management."

In line with the diffusion process, more academics started to show interest, resulting in more programmes coming on board as indicated (late majority). BOCODOL, being a social system, was bound to be affected by theories of diffusion of technology resulting in varied adoption rates in line with Rogers's (2003) categories of adoption of innovations (i.e., early adopters, early majority, late majority, and laggards). These adoption levels were eminent in the projects, as implemented by BOCODOL, as the process was still at the early adopter level and moving towards early majority levels, given that some resisted adopting the practice (laggards). Such resistance by some staff is exemplified in the following excerpts:

Excerpt 16: "I have been supporting over 12 e-Learning programmes under tele-education. The challenge is that students are still more inclined to conventional face-to-face teaching and expect to be fed with information every time."

Excerpt 17: "Staff mostly use internet services to access e-mail, not for e-Learning."

Excerpt 18: "Only a few staff [members] that [are] studying outside with institutions that use online use e-Learning a lot. As for students it is only those who are in tele-education and CDEP."

Another significant challenge encountered by the college was the shortage of personnel to support online learners and tutors, given the growing number of online programmes, tutors and learners. At the time of the study, the e-Learning portal was supported by only three staff members, an e-Learning specialist, an IT specialist database and an e-Learning instructional designer. It has been acknowledged that more manpower was needed to support the development and delivery of e-Learning programmes, and efforts were being made to realise that. Some of the respondents were of the view that the college had low internet bandwidth, which was used for both administrative and educational purposes. This meant that *Moodle* access competed with other institutional operational administrative services for bandwidth, and this has a serious impact on online services for learning. These learners' sentiments were as exemplified in the following excerpts:

Excerpt 19: "E-Learning portal should be available to students all the time, which is not the case at BOCODOL due to limited bandwidth."

Excerpt 20: "The bandwidth is not adequate."

Excerpt 21: "The bandwidth is very limited for delivery of e-Learning and it becomes an obstacle in taking online classes by students."

The bandwidth situation at BOCODOL has improved. Regional connections were increased from 2 Meg to 5 Meg at Francistown, Kang, Palapye and Maun, with Gaborone Region at 10 Meg. Bandwidth at headquarters was increased from 16 Meg to 20 Meg. This situation has resulted in a significant improvement in the speed and services offered to students and staff at lower costs. One of the e-Learning specialists expressed optimism, as captured in excerpt 22 below, that government investments such as the East African Submarine System (EASSy) and West African Cable System (WACS) fibre cables to provide connectivity and improve access to faster internet connectivity, would substantially reduce the costs for the education sector.

Excerpt 22: "The expectation is that the arrival of the undersea cables will lower the high cost of connectivity."

However, partnerships in terms of internet usage should be cultivated (e.g., BOU Francistown region and BAC) so that there is an opportunity to share internet cost usage, or for a common goal of access to online resources at less cost per institution.

What Organisational Results (Outputs) and Societal Impact (Outcomes) Were Encountered during e-Learning Implementation at the Institution?

Another area the college has been actively involved and participating in, is that of Open Education Resources (OER). These projects include: Virtual University for Small States of the Commonwealth (VUSSC); a Bachelor in Business and Entrepreneurship (BBE) course development; and the Open Schooling OER project, which was funded by the William and Flora Hewlett Foundation/Commonwealth of Learning (COL) (Tladi 2016). Additionally, BOCODOL has contributed about five publications to COL to be used as OER. OERs do not only contribute to reducing material development costs, but also affect the quality of education, as these materials are produced following a rigorous schedule of quality assurance checks through peer reviews and expert editing by Subject Matter Experts (SMEs) involved in the collaborative work. OERs have become a logical choice, largely because they are readily available, cost effective, and save on time, which would otherwise be spent on developing materials from scratch.

Lastly, BOU also had a collaborative project with an international organisation called Global Notesmaster Inc. in the UK, to develop an e-Learning platform called Notesmaster Botswana. The aim of the project was to build a global e-Learning network to support open schools with a platform to facilitate the sharing of resources using the Creative Commons licensing concept. The materials developed on Notesmaster were to be available for shared access to all Botswana institutions for free. Additionally, learners and teachers from Botswana institutions would also access material from other institutions in other countries for purposes of curriculum enrichment. In this project, issues of quality were taken care of by the platform, as it was a requirement that all content be peer reviewed before being published.

A Memorandum of Understanding (MoU) was signed between BOCODOL and Global Notesmaster Inc. for implementing the project. The Notesmaster project progress was slow due to human resource challenges, as staff members engaged in the project also had other responsibilities to undertake. SMSs who are content creators also have shortfalls regarding instructional design and thus the need for special training of content creators in instructional design concepts and techniques, more especially for designing instructional materials for online learning. During the course of the project, four workshops were conducted; two for staff and two for learners. Some open schooling programmes (junior and senior secondary schools) content was added on the Notesmaster Botswana site. However, it was noted that the Notesmaster platform also had its shortfalls, as it was being used while being developed on the other hand, and this structural organisation of content was not ideal. Due to the many challenges experienced by the open schooling team in the development of content, the university took a decision to terminate the project in 2019 and rather focus on the use of the *Moodle* Open Source Platform Learner Management System (LMS).

Conclusion and Implications for ODL Field

A major pitfall of e-Learning development is allowing the technology to drive the programmes, instead of the programmes to be driving the technology, serving the role of enabler. To resolve such a scenario, it is important for institutions to first and foremost, determine the technological needs of their programmes, and then embark on finding the best technology to meet those needs, so as to enrich the content for the benefit of the learner. Below are some excerpts from staff and specialists that clearly articulate this view:

> **Excerpt** 23: "Educators should clearly indicate their e-Learning expectations so as to determine the necessary solutions to be provided."

> **Excerpt** 24: "There is a need to provide a pedagogical foundation as a pre-requisite for successful e-Learning implementation to change the emphasis from managing the logistics of electronically delivering e-Learning but encompass managing e-Learning content itself."

> **Excerpt** 25: "Identify students' online learning needs and work on addressing them."

While institutions may have all the technology they need to facilitate the delivery of training through e-Learning, a major challenge has always been to ensure that users are familiar with those technologies, and that they are acceptable to the different age groups to ensure success with training initiatives in ODL. Institutions should also take advantage of older (archaic) technologies as well to support the new ones, so as to create a conducive and enabling learning environment for all as follows:

> **Excerpt** 26: "Providing e-Learning awareness to all staff on their roles in the implementation of e-Learning will improve and impact a lot on implementation."

> **Excerpt** 27: "Try to integrate old practices of teaching and learning with the new in a blended approach to provide a rich and fulfilling learning experience for the students."

The innovation diffusion process, as portrayed in the implementation of e-Learning at BOU, has confirmed the Rogers (2003) model showing the critical categories of innovation adopters during the diffusion of new innovation. The model has served as a relevant theoretical framework that describes either adoption or non-adoption of technology by members of an organisation. While some inputs, processes, outputs and outcomes of e-Learning implementation at BOU were internal to the organisation, some have external outreach. The value chain of some of the outcomes has organisational, national as well as international impact and includes higher order and long-term attributes such as collaborative use of OER, open school collaborative programmes that have not only attracted external funding, but have also produced quality assured and peer reviewed publications. The OER materials have become a logical choice, given that they are readily available and cost effective.

The other innovative global collaborative project (Global Notemaster Botswana), has generated global e-Learning outcomes supporting open schools under the Creative Commons license. These resources are being freely shared across Botswana institutions and can be accessed by other institutions for their curriculum enrichment. Several of these outcomes have, therefore, societal impact both internal to the organisation as well as external to the community.

The inputs, processes and outcomes of the study have implications for the ODL field. E-Learning implementation in ODL alludes to hybridisation, which denotes that the inclusion of digital technologies enables the ODL field, yields varied outputs and outcomes that go beyond the use of archaic ink and pen technologies with limited processes and outputs/outcomes. The OEM framework has served as an ideal model underpinning the study, leading to coherent findings aligned to the identified research questions of the study.

There is a significant trend towards intensifying globalisation, which is strongly supported by the emergence of new ICTs, and this has significant economic, pedagogical, and organisational implications (Oladejo and Gesinde 2014). ODL provides developing countries with a practical, cost-effective strategy to facilitate access to education for the greater majority of the economically disadvantaged members of society, without compromising quality. At the regional level, ODL was one of the priority areas of the SADC Revised Regional Implementation Plan on Education and Training (2007–2015). However, Brown, Anderson, and Murray (2007) have observed that countries need to undertake policy initiatives designed to provide access to the relevant infrastructure. Policies relate not only to education, but also to other sectors such as telecommunications, electrification, and roads and transport, as sound national physical infrastructures are essential for effective open and distance learning delivery (SADC 2009). This study has implications for ODL, especially that e-Learning renders hybridisation, which enables collaborative affordances that go beyond what pen and ink and other archaic technologies have not been able to achieve.

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