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The influence of quality on e-learning implementation in Botswana tertiary institutions: The case for Botswana College of Distance and Open Learning

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ABSTRACT

This paper sought to investigate the extent to which selected quality factors influence e-Learning implementation, which the current body of knowledge purports to be an alternative way of leveraging the provision of support for effective teaching and learning in the new millennium. The study is a case study of Botswana College of Distance and Open Learning (BOCODOL) learners whose studies are supported through online. It is situated within the Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical framework model. The purpose of the research study was to investigate the extent to which the identified quality issues influence e-Learning implementation within the context of BOCODOL. The quantitative research approach used involved sixty-six (66) students from BOCODOL. Data were collected from students using questionnaires and the Statistical Packages for Social Sciences (SPSS) were used for data analysis. The results revealed that the identified quality factors had a significant positive influence on e-Learning implementation at the institution. The study concluded that quality criteria had a positive influence on e-Learning implementation. The study has thus contributed to the existing body of knowledge as the results could be used to inform practice regarding how e-Learning might be implemented within the context of Botswana tertiary institutions.

Keywords: Open school, technology acceptance, e-Learning, quality factors, e-Learning implementation, tertiary institutions.

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INTRODUCTION

The implementation of e-Learning in Higher Education Institutions (HEIs) has seen an increase in recent years, driven by a number of varied factors. According to Macharia and Nyakwende (2010), the past decade has witnessed extensive use of the Internet and Worldwide Web (www) that has made digital technologies to revolutionize higher education practices at universities and colleges all over the world. In addition to good e-Learning infrastructure, issues of quality have also been found to be of critical importance in enabling Higher Education Institutions to deliver and support teaching and learning process to take place with ease. To achieve this, institutions require introducing strategies and policies that support the implementation of flexible academic frameworks and innovative pedagogical approaches, institutional collaboration in development and delivery of content and commitment to access equality for students (MacKeogh and Fox, 2008). However, there have been few studies conducted to investigate e-Learning initiatives in Botswana tertiary institutions resulting in inadequate documented evidence that institutions can use as benchmarks to monitor how quality issues relate to e-Learning phenomenon. This has, to large extent, resulted in the direct adoption of solutions mainly from developed countries, the expectation being that since it worked in those situations, then it should and would also work with the same degree of success in the local environment. This approach has not always produced expected

positive results.

The implementation of e-Learning in tertiary institutions is an involving initiative, which requires the mobilization of many resources as well as fostering a mental paradigm shift for those involved. The few studies conducted (Batane and Mafote, 2007; Ndume et al., 2008) do not adequately articulate discrete issues and challenges regarding the influence of quality on e-Learning implementation. e-Learning studies in Botswana have mainly focused on the performance of specific groups in response to e-Learning implementation. The purpose of this study was to investigate the extent to which some identified quality factors influenced e-Learning implementation at tertiary level using BOCODOL, as a case study. In this study, relevant ethical considerations were adhered to, to ensure ethical compliance. Participants were informed verbally and in writing about their rights to voluntary participation, informed consent, safety in participation, privacy, confidentiality, anonymity, trust as well as withdrawal at any stage of the study if they so wished.

LITERATURE REVIEW

The implementation of a new technology to improve teaching and learning requires well-coordinated implementation strategies with a clear understanding of theories of diffusion and acceptance of technological innovations by users as articulated by Rogers (2003). However, the use of these technologies by Open Schools (OS) in the global south seems to be limited (Du Vivier and Ellis, 2009). Several theories and models have been used in technology acceptance research, and this study focused on only the Technology Acceptance Model (Davis, 1989). This model suggests that the acceptability of a new technology is determined by two main factors (that is, perceived usefulness and perceived ease of use), which by nature are related to the aspect of quality:

i) Perceived usefulness (PU) is defined as being the degree to which a person believes that the use of a system will improve his performance.
ii) Perceived ease of use (PEOU) refers to the degree to which a person believes that the use of a system will be effortless.

The Technology Acceptance Model (TAM) postulates that the attitude of an individual is not the only factor that determines their use of a system, but that it is also based on the perception of the impact, which it may have on their performance. It suggests that with two systems offering the same features, a user will find more useful the one that they find easier to use (Venkatesh and Bala, 2008). This directly relates to the issue of quality, because according to Delone and Mclean (2003), System Quality is measured in terms of ease-of-use, functionality, reliability, flexibility, data quality, portability, integration, and importance, and different researchers have come up with different ways to measure system quality. Implementation of online learning/e-Learning has not been without challenges. In developing countries, there are challenges of interactive tools, pedagogy and accessibility. Other challenges may also include the Geographical, Historical, Political and Socio-cultural factors. All these factors put together, create varying degrees of views and perceptions to online learning, resulting in the need for research to be conducted at a more local level to establish issues relating to the local environment. It is critical to ensure that when e-Learning programmes are developed, pedagogical principles are applied as is done for traditional classroom delivery to ensure maintenance of the same standard of programme quality.

Batchelor et al. (2010) argue that there is need for research to be undertaken to determine how changing pedagogical practice can be embraced to suit the circumstances of today as we have a proliferation of new ideas in the arena of the ubiquitous technologies and their impact on teaching and learning theory. To date a lot of research about e-Learning has been done internationally, continentally and regionally (Nleya, 2009; Uziak, 2009). However, within Botswana, few e-Learning research studies have been conducted, mostly at University of Botswana. Batane and Mafote (2007) conducted research at UB on a group of students using WebCT. Their findings indicated that students were satisfied with the positive impact the technology added to their learning experience. They reported that students' perceptions were that WebCT had greatly improved their learning by making course material easily available and enabled them to participate in online discussions that greatly contribute to their course understanding.

The literature reviewed brings out a number of factors that seem to be at play when e-Learning implementation is undertaken. Coming up strongly are issues of Infrastructure, human resource skills, pedagogical issues, cultural issues, readiness for acceptance of the new technology, cost associated with both equipment and connectivity (Amedzo, 2007; Williams and Eyo, 2011). There are also issues related to quality such as pedagogical practices (Batchelor et al., 2010), quality of materials (Elango et al., 2008) policy issues (Amezo, 2007; Thomas, 2009; Istrate, 2009) and interactivity of the tools used to support learners (Richardson, 2009).

METHODOLOGY

A quantitative case study research design was adopted, with a focus on BOCODOL as the unit of analysis. This approach was found to be more appropriate and a preferred research approach because of its easy access when collecting large quantities of data from the learners

using questionnaires. Case studies are set in contexts that enable clear boundaries drawn around them. These contexts may relate to factors such as geographical location, organizational and institutional contexts (Cohen et al., 2007). In this case, the geographic setting was Botswana, and the institutional context was BOCODOL, whose main capus is located in the capital city (Gaborone) and is easily accessiblre..

The process of selecting a sample was determined by the aim of the study, while the size of the sample was determined by the optimum number necessary to enable valid inferences to be made about the population. The sampling technique used in this study was random selection techniques because the study adopted a quantitative research methodology for purposes of generalisation. The potential respondents for this study were learners enrolled in the various online tertiary programmes at BOCODOL. The research sample was calculated using an online sample size calculator from Creative Research Systems. The population size was calculated based on a ninety-five percent (95%) Confidence Level and a Confidence Interval of ten (10). The selection of respondents was drawn from a population size based on only e-Learning students from the groups of learners involved in studying through the Tel-Education Project of the Pan-African eNetwork Partnership with two (2) universities in India as well as a group of learners enrolled in the BOCODOL Certificate for Distance Education Practitioners course. In both these initiatives, delivery of teaching and learning takes place completely online. The total number of students comprising the sample size for this group was two hundred and seven (207) learners. Using the sample calculator, at a confidence level of 95% and confidence interval of ten (10), a population of two hundred and seven (207) gave a sample size of sixty-six (66). The students' selection was done such that each group had a sample of ten (10) learners per class, gender balanced with five (5) males and five (5) females where possible.

Data were collected by means of a once-off questionnaire. Questionnaires were used to collect data from students because of the large sample population. This made it easy to quickly collect and capture the data. The study found the questionnaire more appropriate as it is a tool that respondents were most likely to be familiar with due to its wide use in most researches. The survey instrument was divided into two (2) parts. Part A dealt with demographics: Section A1 obtained information on gender, age and qualification. A variety of nominal scales were used depending on the type of variable to be measured. Section A2 obtained e-Learning experience of the respondents using both nominal scales and short answer responses. Part B obtained quality factors information related to availability of policies, quality of teaching and learning resources, online interactivity and qualifications standard. Each item was measured on a five-point Likert scale of strongly disagree (1), disagree (2), neutral (neutral) (3), agree (4), and strongly agree (5).

A Cronbach alpha analysis of the reliability of the research questionnaire was performed to establish the level of internal validity of the instrument using SPSS. Cronbach's alpha is a coefficient of reliability (or consistency), used to estimate the proportion of variance that is systematic or consistent in a set of test scores (Brown, 2002). The results of this test, as presented in Table 1, indicated the Cronbach's Alpha reliability test for the variables was very high ranging between .933 and .940.

Table 1. Chronbach's alpha reliability test for the variables.

Variables	Cronbach's Alpha
	Student questionnaire
e-Learning implementation	.933
Quality factor	.940

RESULTS

The analysis of data as a process of inspecting, cleaning, transforming, and modeling the data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making is the main focus of this section of the study. There are differences in how data are analyzed depending on whether they are qualitative or quantitative. Quantitative analyses of data deal mainly with manipulation of numerical data, mainly using tools such as SPSS, as was the case in this study. Table 2 presents the response rates in raw scores as well as percentages. The table shows that from a sample size of sixty-six (66) students only a total of thirty-seven (37) (59.64%) responses were received . The sample size for staff was found to be adequate for the purpose, because Cohen and Manion (1994) argue that:

There is no clear cut answer, for the correct sample size depends upon the purpose of the study and the nature of the population under scrutiny a sample size of thirty is held by many to be the minimum number if researchers plan to use some form of statistical analysis on their data (p. 90).

Additionally, the written interviews by e-Learning Specialists also provided additional data, which was also used for complementarity.

Demographic characteristics

Tables 3 and 4 provide the demographic data for students who responded to the questionnaires in this

Table 2. Response rate for both UB and BOCODOL.

Institution	Sample size	Responses	Response rate %
BOCODOL	66	37	59.64

Table 3. Respondents distribution by gender.

Institution	Gender		Total
	Male	Female	
BOCODOL	13	24	**37**

Table 4. Respondents by age groups.

Parameter	Below 30	31 - 40	41 - 50	51 - 60	Missing	Total
f	19	11	5	2	0	37
%	51.4	29.7	13.5	5.4	0	100

study. Table 3 presents data on student responses by gender, whereas Table 4 presents them by age group. Table 5 shows that the majority of learners were in the age range of below 30 and 31 to 40, totaling 81.1%.

The gender distribution of the BOCODOL responses indicates skewedness to female students with a percentage ratio of 35% males to 65% females. Statistics from the BOCODOL academic records actually indicate that the ODL population trend in Botswana is more female dominated with an overall student gender distribution ratio is 74.3% female and 25.7% males. Though this trend may vary slightly for different programs.

The sample population shows that the age range for the students is very wide with many students in the age range of 30 years and below, and a reasonable number aged between 31 and 40 years. There are also some older students in going up to the age of 60 years, though few in number. This shows that the ODL actually caters for all irrespective of age.

Quality factors affecting e-Learning

Table 5 presents the results of the responses from the respondents on the quality factors affecting e-Learning implementation at BOCODOL. The table indicates that 45.9% of students were not sure whether e-Learning platforms provided adequate security to protect confidentiality of information. A total of 48.6% students believed that there was adequate online security to protect individual information confidentiality. Table 6 indicates that 29.7% of students were of the view that e-Learning courses were better quality than print. There were however 27.0% of students who were not sure whether e-Learning courses were better quality than print. The results indicate that 59.5% of students said that e-Learning course material and support are good compared with face to face and also indicates that 67.8% were of the view that interactive e-Learning course material were better than print. Finally, the table indicates that 54% of students believed that e-Learning qualifications were the same standard as those obtained through face-to-face. The table also shows that 70.3% BOCODOL students agreed that online tools provided better student support.

The students' responses indicated that they believed that the level of security provided by their online platforms was adequate and gave them confidence to use e-Learning systems. They were of the view that online tools provided better support for teaching and learning and that interactive online materials were better than print media. Additionally they were convinced that e-Learning qualifications were of the same standard as those obtained through face-to-face.

Analysis of data collected

Data analysis was quantitative, using frequency distributions and data emerging from the analysis was presented in Table 6. The findings were arrived at from an analysis of the responses from the questionnaires. The data were analyzed using Statistical Package for Social Sciences (SPSS). A Bivariate Factor analysis between the dependent variable and the independent variables using the Pearson correlation coefficient, to determine the degree of the linear correlation (dependence) between two variables was also conducted. A value of 1 indicates total positive correlation, while a value of 0 denotes no correlation, and a value of −1 shows total negative correlation (Cohen and

Table 5. Responses on quality factors affecting e-Learning.

Questions		SA	A	NS	D	SD	M	Total
Adequate security to protect confidentiality	F	5	3	7	1	0	1	37
	%	3.5	5.1	5.9	.7	0	.7	100
e-Learning courses are better quality	F	3	8	0	4	1	1	37
	%	.1	1.6	7.0	7.8	.7	.7	100
Course material and support are good	F	3	19	9	5	1	0	37
	%	8.1	51.4	24.3	13.5	2.7	0	100
Interactive e-Learning material better than print	F	6	19	5	5	1	1	37
		6.2	1.4	3.5	13.5	2.7	2.7	100
e-Learning qualifications the same as face-to-face	F	7	13	9	5	2	1	37
	%	18.9	13.1	24.3	13.5	5.4	2.7	100
online tools provide better student support	F	4	22	6	3	1	1	37
	%	10.8	59.5	16.2	8.1	2.7	2.7	100

SA – Strongly Agree, A – Agree, NS – Not Sure, D – Disagree, SD – Strongly Disagree, M – Missing.

Table 6. Bivariate factor correlations.

		Quality factors
Level of e-Learning Implementation	Pearson Correlation	.882
	Sig. (2-tailed)	.000
	N	37

P < .05; Critical r- value = .329; df = 35.

Manion, 1994). The results shown in Table 6 indicate that the Pearson correlation between Quality Factors and Level of e-Learning implementation was .882, which was much higher than the critical r-value of .329, indicating a very high level of correlation. The conclusion drawn from the analysis was that the students believed that Quality Factors had some positive influence on e-Learning implementation.

DISCUSSION

O'Neill et al. (2004) argue that institutions that are striving to be among the top worldwide in the delivery of, and access to their programmes and services, are those that utilize technology very well. However, it is essential that in doing so, these institutions should at the same time take into consideration the possible potential implications of this initiative for everyone who will be involved in the implementation process. O'Niel et al. (2004) agree with the need for this cautious approach. The current study highlighted that the quality of online learning material was key to a successful implementation of e-Learning. The research study has also identified that learners also needed to be provided with the necessary knowledge and skills for them to be comfortable with the use of new technologies as is the case with the introduction of e-Learning services.

O'Neill et al., (2004) suggest that "providers of quality e-Learning programmes must fight harder for recognition from employers and wider society" as there are some in the society who still harbor some doubts on the quality of this mode of delivery. According to O'Neill et al. (2004), "it is possible that the quality of e-Learning will always be in question, however, through implementation of rigorous controls, institutions can ensure that students are working to attain credible qualifications as they would in a traditional learning environment". The findings of the study revealed that quality issues speak to materials, support, the qualification itself and security. Issues related to the quality of material and interactivity of the tools used to support learners, had implications on pedagogical practices as they had direct influence on the teaching and learning process (Batchelor et al., 2010; Elango et al., 2008; and Richardson, 2009). There is therefore the need to improve peoples' perceptions of

e-Learning so as to dispel any misconceptions and misunderstanding that they may be harboring about the quality and integrity of e-Learning. This would go a long in reducing the number of potential barriers to e-Learning implementation at tertiary level.

CONCLUSION AND RECOMMENDATIONS

The research findings indicated that quality factors had significant positive influence on e-Learning implementation. The following are recommendations made for consideration by tertiary institutions in order to facilitate and improve the implementation of e-Learning within the institution. Tertiary institutions need to develop operational polices with clear goals and expectations to be achieved from the e-Learning initiative so as to guide implementation. This would impact practice and pedagogical aspects of e-Learning implementation:

1. With clear operational policies and implementation strategies, tertiary institutions would be guided on issues of curriculum and content development as well as training requirements to facilitate online teaching and learning.
2. Additionally, the results also indicate that institutional management should be in the driving seat of the e-Learning initiative for institutions to be successful in implementing it. This is important because management will be in a better position to allocate resources adequately from an informed position, as this would greatly enhance chances of success of the initiative being implemented.

The findings of this study have raised areas in which further studies could be undertaken to establish deeper understanding in some specific issues impacting e-Learning implementation in Botswana tertiary institutions, contact and ODL.

Research could also be undertaken to investigate the following:
1. How age and gender for both students and staff influence e-Learning implementation at BOCODOL.
2. To establish the impact of the Local Regulatory environment on e-Learning implementation in the Education space at tertiary level.

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