Adoption and Use of Open Educational Resources at Botswana Open University

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Abstract

The purpose of the study was to investigate the adoption of open educational resources (OER) at Botswana Open University (BOU). The paper examines the journey the university traversed over the years, both as a user and contributor of OER resources. The problem was that despite the institution's involvement in a number of OER initiatives since 2009, it was observed that OER uptake was still slow. The objective of the study was therefore to investigate the perceptions of the academic staff involved in the use of OER programmes so as to examine the successes and challenges experienced by BOU in adopting and implementing OER. The following research questions were posed: What are the perceptions of academic staff on the OER? What skills are required for effective utilisation of OER? What are the challenges experienced in using the OER? The methodology followed a qualitative case study approach and used document analysis with an open-ended written questionnaire as methods for data collection. The research population comprised four lecturers and purposive sampling was preferred. Some of the key findings were that OER were useful, good quality, cost saving and time saving. One of the outstanding findings was that academic staff lacked adequate training on the use of OER. They also required provision of adequate ICT and connectivity resources. Some of the challenges highlighted were inadequate funding as well as an inadequate academic staff complement. The paper recommends possible solutions to address some of these challenges at a local level in line with international trends. Consideration should also be made to capacitate the academic structures of the university with more qualified personnel to take responsibility for programme design and course content using OER.

Keywords: open educational resources (OER); Botswana Open University (BOU); lifelong learning

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Introduction

In the current knowledge-driven global economy, relevant training plays a major role in social development and national economic competitiveness. It is therefore critical to develop programmes and quality learning materials to ensure access to relevant educational opportunities for our citizens. In many developing countries such as Botswana, these ideals cannot be easily met due to limited human and financial resources. To achieve them institutions should introduce strategies and policies so as to have in place flexible academic frameworks, innovative pedagogical approaches, institutional collaboration in development and delivery, and, most crucially, commitment to equivalence of access for students (MacKeogh and Fox 2009).

Therefore, careful consideration should take place to accommodate new technology driven approaches and initiatives such as open educational resources (OER) in the teaching and learning environment, especially in open and distance education. Access to quality educational materials is a challenge in many parts of the world, including in some developed countries. The emergence of open educational resources (OER) is a landmark development in the history of education, because OER support the philosophy of knowledge as a social product and education for all as a human right. The Commonwealth of Learning believes that knowledge is our common wealth and that OER have the potential to put a book in the hands of every learner (COL 2017).

The term "OER" appears to have been first coined by UNESCO (2002) where it was defined as "technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes" (2002, 1). The definition of OER was further extended to include "techniques used to support access to knowledge" (Atkins, Seely Brown, and Hammond 2007, 4). According to the 2012 UNESCO Paris OER Declaration, OER designates "teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions" (Brown and Adler 2008). Open educational resources (OER) are considered as low or no-cost instructional materials accessible through some form of open license (D'Antoni 2008; Hilton and Wiley 2011). The authors observe that depending on the license type, OER materials can be used whole or in part at a lower cost and hence alleviate some of the negative impact of expensive curriculum materials incurred by both the institution and students. In agreement, Jung, Bauer, and Heaps's (2017) study revealed that a significant amount of savings and pedagogical shifts exist with the use of OER. However, they (Jung, Bauer, and Heaps 2017) contend that cost is not the only facet to consider to better understand the impact of open learning materials. Allen et al. (2016) concur, noting that departments are more concerned about the quality of OER materials before adopting them for use in their institutions.

The growing demand for higher education, coupled with the recent 2008 global economic recession, has created unique challenges for higher education institutions emanating from

a shortage of physical and ICT infrastructure, the high cost of course development and the quality of teaching and learning resources. As institutions of higher learning battle to cope with these complexities, OER can make a significant contribution to the much-needed transformative agenda of the education landscape by offering effective solutions to development and improvement of course study material at low cost through the adoption and use of OER. Hew and Cheung (2013) conducted a study to investigate the perceptions and views of a class of Asian undergraduates about the use and production of OER. They concluded that "in recent years, the notion of OER is increasingly being proposed as a way to allow a much larger percentage of people to learn, particularly in an informal way." Considering the potential of OER in the study of Hew and Cheung (2013), given the limited financial resources to produce textbooks and learning materials, the use of OER in higher education offers opportunities for cost saving, among others.

Though research indicates that OER have been available for more than a decade and have led to substantial changes in curricula and course designs (Caswell 2012), this has not been the case in developing countries, including Botswana. According to Amey and Bagopi (2010), the development of OER is a relatively new practice in Botswana. They further observe that efforts to adopt available OER were originally initiated by some institutions such the University of Botswana (UB), the Francistown College of Technical and Vocational Education (FCTVE) and the Mochudi Media Centre, specifically in the area of open source software platforms such as Moodle. The Botswana Open University (BOU) was established in 2017 as a result of an Act of Parliament, No. 13 of 2017, through a transformation and transition of its predecessor, the former Botswana College of Distance and Open Learning (BOCODOL). The involvement and active participation of BOCODOL in OER activities both as a beneficiary and contributor started as far back as 2009. To date BOU continues to benefit from OER as it grows its tertiary programmes. This is not an anomaly as most other developing countries have also started their uptake of OER. However, the pace of adoption still seems to be low in many countries. In comparison, South Africa is listed as the only sub-Saharan African country where OER are emerging as fast at higher education institutions as among other countries of the world (Amey and Bagopi 2010). This situation of inadequate research on the use of OER in developing countries has created a knowledge gap that needs to be addressed.

Theoretical Framework

There are several theories and models that have been used in technology acceptance research, but this study focused on the technology acceptance model (TAM) (Davis 1989) considered relevant to situate this study. The purpose of this model is to predict the acceptability of an innovation such as the use of OER, and to identify the necessary interventions that must be employed in order to improve implementation. This model suggests that the acceptability of an information and communication technology (ICT) innovation is determined by two main factors: perceived usefulness and perceived ease of use. Based on this theory, it is argued therefore that the use of OER by academics will highly be influenced by their perceived usefulness and ease of use. According to

Richardson (2009), there has not been enough work done to study the factors affecting the diffusion of ICT initiatives in developing countries and this presents a knowledge gap, hence the need for carrying out this research as a way of contributing towards filling the gap. Pedagogically, this study is guided by the view that constructivism is the most suitable pedagogical approach to be embraced for the adoption of OER in teaching and learning. A constructivist approach is the most suitable pedagogical approach because it provides students and teachers with online OER resources that they can interact with to create and share knowledge with others (Wilson 2012). Constructivism states that learning is an active, contextualised process of constructing knowledge rather than acquiring it. Knowledge is constructed based on personal experiences and hypotheses of the environment. In this study, the belief is that the adoption of OER could motivate academic staff to increase their participation in the process of creating and sharing resources. Dillon (2001) argues that user experience and training will impact acceptance levels, as will the manner in which the technology is implemented to contribute to organisational goals and working practices. Therefore, how institutions go about introducing OER has a huge influence on their acceptance and use by academics to enhance teaching and learning. As stated, the theoretical framework for this study consists of the following two aspects: 1) the technology acceptance model (TAM) and, 2) constructivism.

Statement of the Problem

The main problem is that while the BOU has been exposed to OER for some years and even had some experience with development and use of OER through active participation in a number of Commonwealth of Learning (COL) projects, the rate of its uptake of OER is still very low. This is a worrying trend that calls for an investigation to gather information about the perceptions of academic staff involved in the delivery of OER programmes. To explore this problem the research was guided by the following research questions:

1. What are the perceptions of academic staff on the OER?

2. What skills are required for effective utilisation of OER?

3. What are the challenges experienced in using the OER?

Methodology

This paper uses the qualitative approach and follows the case study design. It employs document analysis as the method of data collection together with experiences of initiatives the university has undertaken to adopt OER using available documents and reports. Document analysis is "a non-interactive, direct and obstructive measure," which is commonly referred to as content analysis (Robson 1993, 272). It allows the researcher to gather data that interviews and observations may not have elucidated. It is however noted that the documents may be partial and limited, since they are written for different purposes (Denscombe 1998).

A semi-structured reflective report approach was used to obtain feedback on the use of OER within the schools. This was followed by individual interviews to clarify some of the issues raised in the report. The sample consisted of four lecturers responsible for delivery of OER programmes from the two schools of Business Management and Education. A purposive sampling technique was used to include only the suitable lecturers in the sample. A purposive sample is a non-probability sample that is selected based on the characteristics of a population and the objective of the study. Only three of the participants provided the required feedback on their experiences with the delivery of these programmes. Data were analysed in the following thematic areas: general outlook and perception on OER, skills required to use OER, and challenges experienced.

Data Presentation from the Documents

The journey BOU has traversed over the years, both as a user and contributor of OER resources, since its inception as Botswana College of Distance and Open Learning (BOCODOL) to its current status as a university, was very long and demanding. Over the years it participated in a number of OER initiatives and projects. Its first OER initiative was through a project to develop 20 Grade 10 and 12 OER materials for open schooling (Amey and Bagopi 2010). This was a Commonwealth of Learning (COL) project funded by the William and Flora Hewlett Foundation. It started in March 2009 with an aim to increase access to education and contribute towards improving learner achievement through:

- The development of high quality open educational resources;

- Professional development of teachers to increase the effective use of technology in classrooms; and

- Development of support materials for teachers.

The project was successfully completed in May 2011 with the development of two senior secondary level Botswana General Certificate for Secondary Education (BGCSE) open schooling subjects: Human and Social Biology and Geography. These were contributed to the COL repository as OER material for free access and use under the Creative Commons licensing regime together with material from five other countries. There were six participating countries in this project including Botswana, Zambia, Lesotho, Namibia, Seychelles and Trinidad and Tobago. A total of 17 courses (see Table 1) were developed as OER for Grade 10 (Junior Certificate—JC) and Grade 12 (Senior Certificate—BGCSE) out of the 20 that were initially planned (Tladi and Bagopi 2013).

Table 1: OER adapted subjects in open schooling

Grade 10 (Junior—JC)	Grade 12 (Senior—BGCSE)
1. Commerce	11. English
2. Coordinated Science	12. Food and Nutrition
3. English as a Second Language	13. Geography
4. Entrepreneurship	14. Human and Social Biology
5. Geography	15. Mathematics
6. Life Sciences	16. Physical Science
7. Life Skills	17. Principles of Business
8. Mathematics	
9. Physical Science	
10. Spanish	

The institution has also participated in the development of a number of OER tertiary programmes in collaboration with Commonwealth of Learning and the projects conducted through the Virtual University for Small States of the Commonwealth (VUSSC). Table 2 below presents OER tertiary programmes at BOU. Its strength as an OER player extends even beyond the programmes as some of its academic staff have been engaged by the Commonwealth of Learning to undertake OER consultancies at national level (Tladi 2016).

Table 2: OER adapted tertiary programmes

Tertiary Programme	Level
1. Bachelor of Business and Entrepreneurship	Undergraduate
2. Bachelor of Education—Special and Inclusive Education	Undergraduate
3. Postgraduate Certificate in Quality Assurance in Education	Postgraduate Certificate
4. Practitioner Research and Evaluation Skills Training (PREST)	Postgraduate Certificate
5. Commonwealth Executive Master of Business Administration (CEMBA)	Graduate Masters programme
6. Commonwealth Executive Master of Public Administration (CEMPA	Graduate Masters programme
7. Master of Education—Educational Leadership	Graduate programme

In 2013 BOCODOL contributed to the development of tertiary programme content for a Master of Education in Educational Leadership, with its staff contributing to the production of a course on Leading Educational Change with a team of authors from Botswana, Maldives, St. Lucia and Tonga. The development of the programme was a joint venture with members of the Virtual University for Small States of the Commonwealth (VUSSC). Other OER Master's programmes that the institution adopted and contributed to were the

Commonwealth Executive Master of Business Administration (CEMBA) and the Commonwealth Executive Master of Public Administration (CEMPA). The two programmes were developed through the Commonwealth of Learning, which is an intergovernmental organisation, in Vancouver, with a mandate to widen opportunities for learning in the Commonwealth member states. Through these two programmes the Commonwealth of Learning (COL), as a strong advocate for open and distance learning, used these OER programmes to provide distance-learning students a chance to study a traditionally expensive and restrictive programme at an affordable cost.

Data Presentation

This section presents the data related to the perceptions of academic staff, the skills required for effective utilisation and the challenges experienced in using the OER, as guided by the research questions. An additional component was added to capture suggestions from staff on what they thought could be done to facilitate and improve OER utilisation at BOU.

General Outlook and Perception on OER

Academic staff's general perceptions on OER showed that all of them viewed OER as very useful, cost saving and in most cases produced in a manner that addresses global issues. However, participants observed that despite the fact that OER were good, they found that in most cases the materials were not developed for use in open and distance learning (ODL) contexts. As a result, lecturers opined that the process of adapting the materials to the ODL mode of delivery was often daunting and time consuming. Some of the observations from the respondents include the following: "OER are very useful and save time in terms of programme development"; "OER are cost saving for the institution. They save the institution licensing costs"; "OER are current and address global issues."

Skills Required to Use OER

Participants' responses on the question of the skills required for effective utilisation of OER indicated that all staff members felt that they were not very confident with the use of OER, especially dealing with issues of copyright. They also indicated that they needed to be given more training on the use of ICT. As one of them stated, "We need further training on ICT utilisation to develop more proficiency in searching, identifying and proper utilisation of OER."

Challenges

Participants' responses regarding the challenges experienced in using the OER indicated a number of challenges. Overall the respondents indicated that though OER were good, they found that in most cases the materials were not developed for use in an ODL setup. Therefore the respondents were of the view that it was time consuming to adapt and edit the materials for ODL environment delivery. Second, they indicated that bandwidth was also a contributing factor to the challenges on the use of OER. One of them observed the

following: "limited bandwidth and inadequate ICT skills on identification of good OER from various online sources were a huge challenge and disadvantage for staff."

Suggestions

The following were suggested interventions that respondents felt could be considered to improve effective utilisation of OER within the institution. Some of the respondents indicated that there is a need to improve the provision of Internet connectivity in terms of speed and reliability. There is a need to facilitate more training for all academic staff on the use of OER, for example to address the lack of expertise in dealing with issues of copyright. Lastly, they suggested that management should actively drive and promote the use OER in the institution by making sure that specific initiatives on using OER are included in the performance contracts of lecturers. This will motivate them to be more proactive in the identification and adoption of OER in their programme development initiatives across the schools.

Findings and Discussion

The findings of the survey indicate that the views and opinions of staff based on their feedback fall into the three thematic areas: general perceptions of academic staff regarding OER, skills required to use OER and challenges experienced in using the OER, as proposed above. The fourth area is that of suggested solutions. The findings indicate that the results were in line with the technology acceptance model theory. The responses received which indicate that OER were useful and good, save time, reduce costs, assure quality, provide internationalised content scope and infuse current global aspects into the programmes agree with the two factors of perceived usefulness and perceived ease of use of the TAM theory. Respondents also indicated the need for further training on ICT utilisation to develop more proficiency in searching for, identifying, and proper utilisation of OER. The other issue raised by the participants—that in most cases the materials were not developed for use in open and distance learning (ODL) contexts—is actually aligned to the constructivist approach. The challenges identified, which include limited bandwidth and a lack of the necessary ICT skills to fully optimise utilisation of OER resources, were also in line with the aspects of perceived usefulness and perceived ease of use. Without the bandwidth and skills, OER would not be easy to access and or be of any use to teaching and learning. As a result of these observations, lecturers opined that the process of adapting the materials to the ODL mode of delivery was often daunting and time consuming.

At Botswana Open University (BOU) efforts were being made to mitigate these challenges experienced when adopting open educational resources (OER). Some of the respondents indicated that there was a need to improve the provision of Internet connectivity in terms of speed and reliability. They suggested that management should actively drive and promote the use OER in the institution, for example by encouraging recognition of their use through inclusion in the performance contracts of lecturers. This they believe would

raise the level of awareness of the value of these resources among all lecturers and hence might contribute meaningfully to the OER resources production.

Conclusion and Recommendations

In conclusion, the findings indicate that the use of OER at Botswana Open University continues to grow with time through direct and indirect participation at both institutional and individual levels through projects and consultancies. The perceptions and opinions of staff on OER also gave a view that all is not perfect, but rather that there are issues and challenges that need to be attended to in order for better implementation and positive outcomes to be realised. Regarding the first research question about the perceptions of academic staff on OER, the results indicated that staff were of the view that OER are useful and have a lot of potential to assist the institution to positively drive the growth and transformation of the new open university, in the area of programme development. In terms of the second question on the skills required for effective utilisation they indicated that skills were a key component required by staff for successful utilisation of OER. Lastly, the respondents' views on the third research question concerning the challenges experienced when using OER presented a list of challenges on various aspects, as presented in the findings. It is the view of the authors that the findings of this study have addressed the research question and that all concerns raised by the respondents require action to promote and facilitate an increased rate of adoption and use of OER in any tertiary institution, BOU included.

OER provide the education sector with a unique opportunity to improve teaching and learning, and to reduce the cost of developing new programmes by facilitating efficient and effective sharing of free quality educational resources. With resources still scarce following the recent global economic recession, it has become evident that developing nations need to adopt more cost effective and affordable lifelong learning options for the 21st-century economies. It is therefore clear that institutions of higher learning wishing to improve on their programming, both in terms of quality and quantity, in a more cost-effective manner, should embrace the use of OER. BOU is no exception as it has shown potential to fully embrace and realise growth in the use of OER as a viable strategy for providing quality content development at a reduced cost.

BOU is operating in a completely new space of tertiary education following its recent transformation from a college to become the only ODL university in the country. Like other tertiary institutions in higher education, it is also experiencing growing competition amidst limited resources, hence the need to look for new cost recovery models that can enable it to survive and where possible even outperform some of its competitors. To achieve this, it is recommended that BOU should foster a culture of sharing and reusing content developed by others internally and externally in the OER space through various initiatives as a way of promoting openness and access. BOU should strive to become a significant contributor to the production of OER resources. It should also create an enabling environment through providing staff with appropriate ICT training in order to help harness the potential of open

educational approaches. Lastly, it should capacitate the academic structures of the university with more qualified personnel to take responsibility for programme design and course content development. Zhang and Li (2017) suggest that there is a great need to set up a special organisation to hold more seminars, workshops or training programmes at regular intervals to introduce online teaching methods and OER usage skills to all faculty members.

Additionally, it should also be acknowledged that achieving this is a great challenge because according to the action plan of the National Symposium on OER held in Kenya from the 6 to 7 June 2013, lack of OER policy in institutions was identified as one of the barriers to increased knowledge, production and use of OER. It is therefore very critical that institutions make it a priority to embark upon the development of OER policies to guide their OER initiatives (Abeywardena et al. 2018). This will provide a foundation upon which OER will be built for better implementation results individually and nationally.

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