THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS) FOR ENHANCED TEACHING: THE CHANGING ROLE OF INSTRUCTORS

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Abstract

The use of ICT in teaching and learning has changed the role of instructors, enhanced the quality of instructional activities, and increased accessibility of education to privileged groups. This study assessed the extent to which University of Botswana (UB) instructors use available ICTs and find out if these have any impact on their teaching. The study was situated within the Information and Communication Technology for Enhanced Teaching (ICT4ET) framework. The study used both quantitative and qualitative research methods to collect data. The sample (N=63) was drawn from the UB teaching staff. The findings of this study indicated that the majority of instructors at UB use ICTs available at the institution, albeit the prevailing technological challenges. Instructors appreciate the role technology plays in teaching and learning processes in terms of making these processes more interactive, enabling instructors to easily manage large classes, work from any place; and reducing pressure caused by limited time for face-to-face.

Keywords: use of technology; training; accessibility; readiness; availability; adoption, and impact.

Introduction

The use of ICTs in education has certainly had impact on teaching and learning (Barak, Nissim & Ben-Zvi, 2011; Eickelmann, 2011; Roseth, Garfield & Ben-Zvi, 2008; Summak, Samancioğlu & Bağlibel, 2010; Voogt & Knezek, 2008). It is upon this premise that the UB has spent huge amounts of funds to build an ICT infrastructure and promote the use of ICTs in instructional activities. This study was conducted to assess the extent to which UB instructors use available ICTs, and find out if these have any impact on teaching. The ICTs have increased accessibility of education and made it easier for academic institutions to reach learners from poor families, prisoners, learners with disabilities, old aged, women and children, and people living in very remote areas (Starčič, Brodnik, & Kljun, 2007). Learners from these underprivileged groups are now able to access knowledge anytime and anywhere. These technologies are transforming the instructional processes through their potential to place a plethora of information at learners' finger-tips and a means to facilitate interaction and dialogue between instructors and their learners, and among learners themselves. This has in a way changed the role of instructors as they are no longer viewed as 'fountains of knowledge', but rather facilitators who manage instructional activities. In addition, ICTs may be used to relate learning experiences to work practices, equip learners with skills needed in the modern day world of work, in that way preparing them for future lives and careers (Angadi, 2014). However, for instructors to realise the benefits of ICTs, they must adopt them and use them appropriately in their courses (edutopia, 2015; Haefling, 2009). There has to be leadership support in terms of funding, coming up with policies and strategic frameworks to facilitate technological transformation. Technology transformation is a very expensive endeavour, therefore, there has to be adequate funding to acquire resources in terms of both hardware and software. The training of users and technical support would also be required to equip them with relevant ICT skills and the ability to appropriately integrate these ICTs in instructional processes.

The purpose of the study

UB, just like other Higher Education Institutions (HEIs), has taken an initiative to provide ICT infrastructure, technical support and training to assist its academic staff to use technology in their

teaching. The purpose of this study was to assess the use of ICTs by instructors at UB and find out if these has any impact on their teaching.

Conceptual framework of the study

This study was situated within the ICT for enhanced teaching (ICT4ET) framework, which has been adapted from ICT for development (ICT4D) Value Chain model (Figure 1). The model consists of four main domains, namely, *Readiness*, *Availability*, *Uptake* and *Impact*. These aspects are defined in more detail later in the paper.
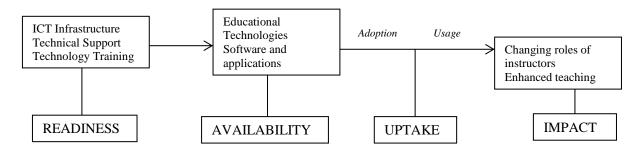

Figure1. Conceptual framework of the study (Adapted from ICT4D Value Chain model, Heeks & Molla, 2009)

Readiness

In the context of this study, *readiness* refers to the basic requirements needed to start using ICTs within an organization such as UB. Therefore, the study considered the following aspects regarding readiness:

- *ICT infrastructure* - which is available at UB
- *Technical support* - eLearning support Unit providing the necessary technical support, and
- *Technology training* – training of instructors to equip them with ICT and eLearning skills.

Availability

This phase of the study considered the resources that are available and accessible at UB. In this study, the ICTs which are predominantly used in teaching at UB were Internet, Projectors and PowerPoint, Learning Management Systems (i.e. Blackboard and Moodle), Social Network tools, and Simulation and games.

Uptake

In this context, *Uptake* includes the adoption of technology and its effective use for instructional purposes. Technology adoption is defined as, 'a process that begins with awareness of the technology and progresses through a series of steps that end in appropriate and effective usage' (Bridges to Technology, 2005). At this stage, users needed to learn about technology and its benefits, and then evaluate its usefulness and usability. It is after this stage that users would then accept and learn to use the technology. Technology adoption is important because it is the vehicle that allows most people to participate in a rapidly changing world where technology has become central to our lives (Bridges to Technology, 2005).
(Format the paper accordingly)

Impact

Lastly, is the *Impact* stage, which in this context considers enhanced teaching and the changing role of instructors. Instructors at this stage would have to employ innovative teaching strategies which are more learner-centered, such as, research projects using assigned websites, online discussions, creation of eportfolios, etc. (Roseth, Garfield & Ben-Zvi, 2008; Barak, Nissim & Ben-Zvi, 2011).

The Objectives of the study

The following objectives have been identified for this study:
   a) to measure the extent to which instructors at UB use selected ICTs available at the institution,
   b) to find out if ICTs have any impact on teaching, and
   c) to identify challenges instructors experience when using ICTs at UB.

Research Questions of the Study

The following research questions were asked to guide this study:
   1. To what extent do instructors use available ICTs?
   2. What impact do ICTs have on teaching?
   3. What challenges do instructors experience when using ICTs at UB?

Delimitation

   There are many technologies that are available that can be used in the teaching and learning processes. However, this study selected only those that are predominantly used at UB, namely, Internet, projectors, learning management systems, e-mail, social networks, simulations and games. The study conducted their educational use by UB instructors to assess the impact these hàve on their teaching and find out if there are any challenges experienced.

Limitation

   The adoption and use of ICTs in teaching is influenced by a number of factors such as attitudes, self-efficacy, training, experience and age (Yusuf, Balogun, 2011; Teo, 2008). However, this study only focused on how often instructors use ICTs in their teaching. In addition, the study only considered the impact of ICTs in teaching, and has left out the learning process, which is an equally important component of the instructional process. The impact of ICTs in the learning process is a very broad and would which would change the focus of the study, the sample population, and involve more data. However, the author acknowledges that leaving out factors that influence the usage of ICTs narrows the study in that it does not give a complete picture of why instructors are not using these technologies.

Relevant Literature

Training and support

   Literature indicates that lack of adequate training is the biggest obstacle to instructors using technology in their instructional activities (Liu, 2008). Technology training helps instructors to be more confident and competent in their ability to use or learn about technology; and positively influence their attitudes towards technology (Marwan, 2008; Akpinar & Bayramoğlu, 2008). Zhao and Bryant (2006) have also contended that the use of technology in teaching is effective at basic level, but cannot lead to higher levels of technology integration without any support. They argue that lack of constant technical and instructional design support may contribute to a lower than desirable rate of integration even after training.

Adoption of technology

Technology has become central to the lives of most people and has definitely infiltrated academic institutions making it difficult for the academics to ignore it. As a result, adopting it in HEIs would inevitably allow instructors to change their teaching practices so that they become relevant to the young generation who were born into technology. Straub (2009) however, argues that technology adoption is a complex, inherently social, developmental process whereby users have to construct unique and flexible perceptions of technology that influence the adoption process. Masalela (2011), pointed out that adoption of technology would create new avenues for learners to access educational opportunities both on campus and off campus. This conforms to the UB learning and teaching philosophy which aims to extend access to higher education through the utilization of ICTs and develop a technologically advanced teaching and learning environment (UB website, 2015). The Johnson, Adams, Estrada and Freeman (2015) has come up with six important ways which might help in speeding up technology adoption in HEIs:

1) *Advancing cultures of change and innovation*: - HEIs need to revamp their structures to allow for flexibility, creativity, innovative thinking, and adopt learner-centered teaching approaches.
2) *Increase of cross-institution collaboration*:- Academic institutions need to share best practices, experiences, in order to overcome some of the challenges they face when trying to implement technology transformations
3) *Growing focus on measuring learning*: ICTs, more specifically LMSs enable instructors to give online activities such as forums, assignments, online quizzes, etc. The data from these activities could be gathered and analyzed to measure individual learner performance, empower students to take an active part in their learning, and identify at-risk learners for remedial sessions.
4) *Proliferation of open educational resources that reside in the public domain and are freely available to instructors over the Web*: Instructors in HEIs need to be made aware they can access these resources and their benefits to learners as outlined by d'Antoni (2009):
   - An independent learner who has access to the Internet can access material from some of the best universities in the world.
   - Open Educational Resources (OER) can promote informal learning, where a credential is not needed.
   - Prospective students may access institutions by looking at their materials made available by other institutions.
5) *Increasing use of blended learning:* This is whereby instructors combine the best elements of online learning and those of face-to-face sessions (Poon, 2013). This pedagogical model encourages learners to learn in an interactive, collaborative environment, at their own pace, and in their own time (Poon, 2013).
6) *Redesign learning spaces:-* not only to conform to the advancements in learning theories, but to also conform to the new generation of learners. Brown (2005) describes learning spaces as those areas in which learning takes place, for example, classroom, a chat room, or virtual environment. At the University of Botswana classrooms, lecture theaters, library and computer labs are the primary locus for learning.

Usage of technology

The second step under *Uptake* in the ICT4ET conceptual framework is *usage*. This is whereby users demonstrate appropriate and effective use of the technology. There are many ways ICTs can become an integral part of the learning process and have impact on teaching and learning. This section discusses the literature reviewed on usage of selected ICTs that are commonly used at UB.

Use of the Internet

The Internet, because of its hyperlinked environment has emerged as the single most powerful tool that allows instant access to other online resources, and unlimited world-wide information (Kumar & Kaur, 2006). Internet-based teaching tends to be more learner-centred and more effective when compared to traditional methods in terms of quality of learners' research papers, reference sources used in learners' assignments, and analytical ability, synthesis, and summarization of information (Kupczynski & Hooper, 2006; Lu, Ma, Turner & Huang, 2005). However, Ward, Peters and Shelley (2010) observed that some instructors are reluctant to use the Internet in their instructional activities. Part of the reason for this unwillingness could be that when using Internet in teaching instructors are not just introducing a new technology, but also a new approach to teaching (Kupczynski & Hooper, 2006; Lu, Ma, Turner & Huang, 2005; Ward, Peters & Shelley, 2010). It has to be noted that the Internet on its own would not enhance teaching and learning. Instructors have to develop clear learning targets, direct learners to specific web sites, and focus on the content to be taught (Johnson, 2011). Furthermore, even though the Internet has shown to be an effective instructional tool, instructors need to be aware of the risks associated with its usage, such as, learners becoming addicted to Internet and ignore coursework; plagiarism; too much information available to learners making it difficult for them to select the one relevant to the topic; and biased/unreliable information (Brändström, 2011; Sileo & Sileo, 2008).

Use of projectors

A study conducted by Martinho and Pombo (2009) to evaluate the potential of ICT in the Teaching of Natural Sciences with regard to the commitment, motivation, rigor and student learning, showed that there is an increase in test scores among students who are taught using projectors; viewing educational videos; Internet search. Rolando, Salvador and Luz (2013) argue that the incorporation of data projectors in the course improve learners' concentration and increase their enthusiasm to learn. It has been observed that projectors have become an in-built part of many instructional settings, mostly in large classes and in courses focusing more on information exchange than skill development (Smith, 2014). Smith (2014) further argues that it can be a highly effective tool to support teaching and learning, and highlighted its potential benefits in teaching and learning such as, enabling instructors to cater for multiple learning styles; increase visual impact; improve learners' focus; assist instructors to analyse and synthesise complexities; and increase spontaneity and interactivity.

Effective use of learning management systems in teaching

According to Kibble, Kingsbury, Ramirez, Schlegel and Sokolove (2007), Learning Management Systems (LMSs), such as, Blackboard and Moodle, facilitate course organization, teaching delivery, communication, collaboration, and assessment. Furthermore, these systems have the potential of tracking the learning progress of individual learners, identifying skills gap and reporting to instructors for remediation (Koller, Harvey & Magnotta, n.d.). Despite the benefits of using LMSs, Kibble, Kingsbury, Ramirez, Schlegel and Sokolove (2007) argue that instructors are not fully utilizing these technologies. Steel (2009) reported that many university instructors have difficulty using LMSs to create learning designs that are truly engaging to their students although they were bought with unprecedented enthusiasm. He points out that the level of integration and quality of usage is low in universities. Literature shows that there are diverse perceptions about LMSs. For instance, Apedoe (2005) says LMSs promote instructor-centred approaches; Naidu (2006) says they encourage passive modes of learning and lack the capability to engage learners in higher level cognitive and social learning; and Papastergiou (2006) says LMSs do not easily support the kinds of assessment formats that are well-suited to social constructivist practices, lack a sound structure to efficiently manage student interactions. However, Smith (2014) argues that LMSs ensure that all learners have access to equivalent learning experiences, promote an inclusive, social and engaging learning environment, offer opportunities for flexibility, reflection and just in time feedback and

learning, promote a favorable atmosphere for explorative learning. Furthermore, LMSs are said to be powerful technologies that have yet to reach their full potential and are important for the Information Age paradigm of education (Watson & Watson, 2007).

Use of e-mail as a teaching tool

Wang (2010) observed that most learners are not able to ask their instructors questions face - to - face during lecture periods because of shyness, and sometimes the questions are just too many. Therefore, the e-mail tool provides learners with the platform to say whatever is in their minds without fear of being intimidated. Wang (2010) further outlines some of the benefits of using e-mail in teaching and learning, such as, learners learn a communication tool that is used throughout academia and work place; communicate with their instructors and peers; develop listening ability (audio material send via email); develop reading ability (reading materials send via email); problem solving and question answering; and easy to distribute and update curriculum materials (handouts, readings, and study questions).

Use of social networks in teaching

The goal of blending traditional teaching situations with technology are specifically to support learner-centred, active, and collaborative teaching-learning processes as stated in UB eLearning definition (Gachago, Mafote, Munene-Kabanya & Lee, 2007). Social networks offer learners with tools to create, write, publish, read, and play an active role in learning (Alexander, 2006; Maged, Kamel, Wheeler, 2007). Just like the email tool discussed above, social networks such as, Facebook, Twitter, and many others provide favorable platforms for learners to express themselves. Subrahmanyam, Reich, Waechter and Espinoza (2008) have observed that online social networking has been deeply embedded in the lifestyle of young people, and since university learners occupy a large proportion of this group, one would expect them to use these social networking platforms. Instructors therefore could use this opportunity to integrate them into their instructional activities for collaborative learning. Literature shows that social networks facilitate better job performance, learning and academic success (Yu, Tian & Kwok, 2010); foster critical thinking (Barnes, Marateo & Ferris, 2007); physical and psychological well-being (Ellison, Steinfield & Lampe, 2007); and promote student-centered learning practices (Yu, Tian, Kwok, 2010). Although social networks have their benefits, some authors warn of the dangers associated with them, such as, exposing oneself to strangers, sexting, cyber-bullying, receiving inappropriate images (Bugeja, 2006; EyeGuardian, 2011). It is therefore very important for university instructors to offer advice to learners in terms of the appropriate use of these technologies (Bugeja, 2006).

Use of simulations and games in teaching

Literature indicates that simulations and games have educational potential and therefore may be used to support curricula objectives (de Freitas and Oliver, 2006). According to de Freitas and Oliver, 2006), the use of games and simulations for teaching has important implications for supporting and reinforcing one another in order to accelerate learning, support higher-order cognitive development and strengthen motivation in skills-based learning. Furthermore, McCall (2012) contends that simulations and games may be used to teach learners to perform real-world tasks effectively, such as flight simulations, business simulations, digital microcosms that model scientific and mathematical concepts; and historical simulation games that present the learner with situations which are visual, spatial, and aural worlds with challenges that the learner must overcome. He assets that these games offer interactive and multimedia representations that engage learners through multiple modes of communication: visual, textual, and tactile. However, simulations are not an educational panacea, nor should they be employed for all learning objectives. McCall (2012) argues that simulations and games have weaknesses such as, entertainment bias, oversimplification of complex processes leaving out many important issues, significantly counterfactual outcomes, over-access to power and information, emphasis on goal-seeking and individual choice, and quantification bias.

Impact of ICTs on teaching

The appropriate use of ICTs has great impact on teaching and is definitely changing the role of instructors (Summak, Samancioğlu & Bağlibel, 2010; Voogt & Knezek, 2008). Contemporary instruction is no longer dominated by instructors, but the focus is on learners and as a result the instructor's role is to create learning environments in which learners exchange ideas and work together in solving problems (Eggen & Kauchak, 2010). It has to be noted though that technology on its own does not directly change teaching or learning, but it is how technology is incorporated into instruction (Interactive Educational Systems Design, 2014) that brings about desirable learning gains. Summak, Samancioğlu and Bağlibel (2010) and Voogt and Knezek (2008) argue that if ICTs are effectively used in teaching and learning activities, they can provide learners with engaging opportunities to find and utilize current information and apply academic skills for solving real-world problems. Consequently, the whole instructional process would be enhanced, leading to improvement of learner academic achievement (Gulek & Demirtas, 2005).

Methodology

This study adopted both quantitative and qualitative research methods (mixed method), to collect data, taking into consideration the limitations of both methods. Although quantitative method involves a greater number of subjects and enhances generalization of results, its limitation is that it is not suitable for answering the explanatory why and how questions (Slavin, 2007). In the case of qualitative method, it allowed the researcher to acquire a more richer and more valid understanding of research questions that are being studied and to some extent, increase confidence in the findings and probably help to identify important issues and inform decision-making (Slavin, 2007; Richey & Klein, 2007). However, its limitations are that findings cannot be generalized (Atieno, 2009); Very time-consuming and usually requires substantial cognitive & language ability & stamina (Kirkevold, n.d.).

Sampling

The population of the study was drawn from the University of Botswana. Since the study was about the use of technology resources in teaching, it was only limited to the 330 teaching staff who have adopted technology-based teaching. Participants who have attended eLearning workshops offered at UB were identified through the database of the Educational Technology Unit. A simple random sampling was used and the sample size was sixty-three (63).

The instruments

A survey questionnaire containing quantitative questions was used to collect data and this was emailed to respondents. The questionnaire measured how often instructors used technology resources. The questionnaire items examined whether respondents used technology to enhance teaching and learning processes, developing course material and work; used Blackboard or Moodle learning management systems; used communication tools within LMSs and social networks such as Facebook, Twitter, etc.; used Excel spread sheet or Online grade book to analyse students' work; used simulations and games; and used data projector in their lectures. The items used in the questionnaire were created using some questions modified from related research and others adopted from Teo and Koh (2010); and Wang (2004). The scale had nine (9) survey items. Each item was measured on a five-point Likert scale of strongly Never (1), Rarely (2), Sometimes (3), Often (4), and Very Often (5).

Data analysis procedures

A frequency graph was drawn using SPSS to indicate the frequency of responses in percentages against survey items for technology integration scale. From the frequency graph, deductions were made as to how often instructors used technology resources. The qualitative data collected was used to complement the quantitative data considering the limitations of quantitative

method not being able to answer explanatory why and how research questions. Since qualitative data was collected basing on the experiences and perceptions of respondents, the narrative analysis strategy was used to analyse the data.

Results

      The results are presented under each of the research questions asked in order to guide the study.

Research question 1: To what extent do instructors use ICTs?

      Figure 2 shows frequency of responses in percentages against survey items for technology integration (TI) scale. A Likert scale was used from 'Never' to 'Very Often'. The scale had nine (9) survey items. From the results displayed, respondents were asked whether they used technology in their courses to enhance student learning. The results show that the majority (94.5%) of the respondents used ICTs to enhance student learning and the majority (74.0%) use them to improve their teaching. The ICTs used are also shown in the Figure 2.
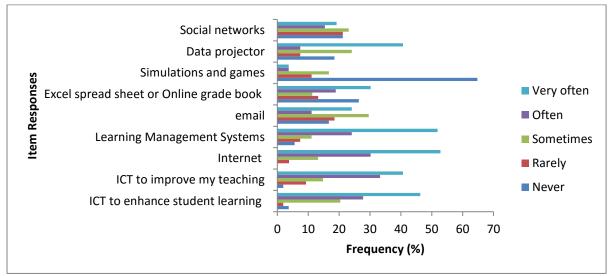

Figure 2: Respondents' answer per item in the TI scale

Use of Internet and LMSs

      On whether the respondents used Internet for ideas when developing course material and in their general academic work; the results showed that the majority (96.2%) of respondents used Internet. Similarly, on whether respondents used Learning Management Systems such as Moodle, Blackboard or WebCT (Item 4), 87.1% indicated that they used these technologies. Respondents indicated that learners accessed their course material from these LMSs and that this has increased learners' accessibility of resources as instructors are able to put up more resources for learners' online. In terms of preparations and teaching, instructors adapted their material to fit the online environment and use available tools within Blackboard or Moodle which makes their teaching more effective, and learning more organized.

Use of email

      On whether respondents used email in Moodle or Blackboard to keep students up-to-date on grades and student progress, on average, 64.8% of respondents use email for instructional purposes. More than half (64.8%) of the respondents appreciate the importance of using email to promote interactivity between instructors and learners. They reported that the use of email increased contact

time between instructors and learners. The email has changed instructors' conventional understanding of "consultation hours" or "working hours", because learners do not need to wait for the stated consultation hours to see them. Learners just had to drop an email rather than them going to instructor's office and not finding them. Furthermore, learners who were shy used email to ask questions or raise issues related to the course. That was not an excuse anymore because technology had made their live easy. However, some (35.2%) of respondents reported that they communicate with learners directly in classrooms and have not seen the need to do it electronically, more so that the attendance rate was very high.

Use of Spreadsheet or Gradebook

On whether respondents used Excel spread sheet or Grade book to analyze student work, the results showed that more than half (60.4%) of respondents use these applications. Respondents reported that technology made teaching easier and more efficient, especially when one does not have a teaching assistant. It also helps in grading online activities and providing quick feedback which enhances formative assessment, and it enabled instructors to analyze learners' performance within a reasonable time so as to provide feedback to students.

Use of simulations and games

On whether respondents used simulations and games, the results showed that only 7.4% of respondents indicated that they used these technologies. On whether respondents used data projectors during lectures, the results showed that on average, 72.2% used this technology resource. Respondents reported that projectors enabled instructors to work faster and cover more material than if they wrote notes on white/chalk board. Projecting PowerPoint slides also facilitated coverage of more content during a lesson than when using the conventional way of teaching whereby one has to use the chalk board, and rubbing it off – which is time consuming. However, there were those who reported that they were not using projectors because the classrooms they use did not have projectors and computers.

Use of social networks

Respondents were asked whether they used communication tools in Moodle and Blackboard, and or other social networks such as Facebook, Twitter, and others to communicate or collaborate with learners. It was observed that, on average, 57.7% used these technologies resources. Most of the respondents appreciate the importance of using communication tools to promote interactivity between instructors and learners. They reported that these technologies made teaching and learning more interesting, interactive and organized. Some reported that using online communication tools enabled learners to like their teaching more and also got the learners to take responsibility over their own learning.

Research question 2: What impact do ICTs have on teaching?

Respondents were further asked whether they used technology in their teaching, and if 'yes', how technology changed their teaching. The majority (66%) of respondents reported that they used technology for teaching but were at different levels of proficiency. Some respondents indicated that they were still beginners and were just able to do basic things such as, PowerPoint slides, projection equipment, and putting their course material on Blackboard. However, more than half (57.7%) reported that they were at a more advanced stage and were able to use forums, chats, social networks such as Facebook, Twitter, etc.

In terms of how technology has changed their teaching, respondents reported that technology has had a positive impact on their teaching. The following excerpts demonstrate such positive impact:

Excerpt 1: *"Technology gives flexibility in the sense that it makes teaching and learning to become interactive process between an instructor and a learner"*

Excerpt 2: *"Instructors can easily manage large classes and can work from any place and has reduced pressure caused by limited time for face-to-face and large class numbers of students as one may distribute learning tasks over time and over small groups using technology"*

Excerpt 3: *"Technology has made it possible for instructors to come up with learning activities which will always be available to the learners in future, as opposed to learners losing the activities printed on paper and one forced to re-print them"*

Research Question 3: What challenges do instructors experience when using ICTs at UB?

Less than half (30%) of the respondents reported that they were not using technology in their teaching and the reasons they gave were, technophobia; inadequate skills to use technology in teaching; weak technical support; limited ICT knowledge and skills in some of the available technologies; network/connectivity problems; power cuts; inadequate resources; and that the use of ICTs in teaching involves a lot of work. Include some summary statement here, it could be supported by some academic reference. As it is now, it looks hanging.

Discussion

Use of ICTs by instructors

The findings of this study indicated that the majority of respondents use Internet, Blackboard and Moodle, email, and Excel spreadsheet. The reason for using the Internet very often at UB could be due to the fact that this technology is readily available. Instructors use the Internet to develop their teaching materials and for research purposes. This study has indicated that ICTs enable instructors to access teaching and learning resources from all over the world; promote interactivity between instructors and learners and amongst learners themselves; and access online journal articles. Considering the UB goal of advocating for learner-centered teaching approaches, these findings show a paradigm shift from instructor-centered teaching approaches to Internet-based teaching, and the use of Blackboard and or Moodle. This type of teaching approach provides leaners with deeper leaning experiences. It is more learner-centered and more effective when compared to traditional methods in terms of quality of learners' research papers, reference sources used in learners' assignments, analytical ability, synthesis, and summarization of information (Kupczynski & Hooper, 2006; Lu, Ma, Turner & Huang, 2005).

Since Blackboard and Moodle are web-based systems, instructors create links to online resources related to the course they are teaching which then increases learners' accessibility to learning resources. On the contrary, the findings suggest that there are still those instructors who are reluctant to use ICTs. These instructors perceive the incorporation of ICTs into instructional activities as something that involves a lot of work. For instance, one has to do a lot of planning on how a selected technology would be used in the lesson. The instructor would also have to learn how the technology works. But with traditional lecture method, which is predominant at UB, one just goes to class and divulges information to be taught to learners. This negative perception by some of the instructors is mainly a question of attitude and technophobia. Some excerpts would go a long way to complement such findings and suggest you fit a few in this part if available. Furthermore, literature indicated that the unwillingness could be that when using technology in teaching instructors are not just introducing a new technology but also a new approach to teaching (Kupczynski & Hooper, 2006; Lu, Ma, Turner & Huang, 2005; Ward, Peters & Shelley, 2010). Therefore, instructors want to stick to the traditional methods of teaching which they are most comfortable with. To address this matter UB would need to change the technology training strategy it has been using and target academic departments. Why would such an approach work – briefly justify. Heads of departments would play a major role in ensuring that their staff attends the training.

Blackboard and Moodle have communication tools such as forums, chats, e-mail and blogs. Social networks such as Facebook, twitter and many others that can also be linked into these LMSs. The findings of this study indicated that only 57.7% of respondents use these technologies and have indicated positive perceptions about them in terms of providing favourable platforms for learners' to express themselves and foster critical thinking. This is surprising because online social networking is deeply embedded in the lifestyle of young people, especially university students (Subrahmanyam, Reich, Waechter & Espinoza, 2008). Instructors could be the ones holding back learners to use these technologies in their learning processes. Further research has to be conducted on this area to find out why UB instructors are not keen in using communication and social networks in their instructional activities. In addition, instructors need to work closely with instructional designers when developing their eLearning courses so that Instructional Designers may work with them to develop learning objectives and course content which matches those objectives; guide instructors on pedagogical issues of online course development; and assist in evaluating the instructional effectiveness of course materialas to assist in the integration of ICTs into the learning and teaching process.

With regard to simulation and gaming, it was observed that these are rarely being used at UB despite the benefits. The reason for this low percentage could be due to the fact that there is no training focusing on the use of simulation and gaming. UB should come up with an eLearning workshop on Simulations and Games, and make instructors aware of the benefits of using these technologies in supporting curricular objectives. Instructors should be aware that these technologies support what UB eLearning definition points of providing active and multimodal learning processes which is visual, textual, spatial, aural, and tactile. The sentence before does not read well, please re-cast it for better readability. As regards projectors, the majority of UB instructors have indicated that they use them in their presentations. These technologies are readily available in technology enhanced classrooms at UB, '… to help instructors to be more effective; increase visual impact; improve learners' focus; and increase spontaneity and interactivity (Smith, 2014; Martinho & Pombo, 2009; Rolando, Salvador & Luz, 2013)'.

Impact of ICTs on teaching

The study has shown that more than sixty per cent (60%) of UB instructors appreciate the role ICTs play in their instructional activities in terms of enabling them to employ different teaching methods, promoting interactivity and allowing them to manage large classes. This positive impact has not only enhanced teaching and learning, it has also changed the role of instructors from being 'fountains of knowledge' to being facilitators, guides, consultants, resource providers, and learning-team members (Barak, Nissim & Ben-Zvi, 2011; Eickelmann, 2011). This is because with ICTs, learners have a plethora of knowledge at their finger-tips. ICTs have the potential to send course content from instructors to learners, for example, through Blackboard/Moodle, or other audio-visual and web-based applications. Since teaching nowadays advocates for open, active and collaborative learning, these technologies may be used as a means of interaction and dialogue. However, as indicated earlier in the literature, technology on its own would not have a positive impact on teaching, but it is how technology is incorporated into instruction (Interactive Educational Systems Design, 2014) that makes a difference. Instructors therefore need to work very closely with Instructional Designers and other educational technologists to effectively integrate ICTs in their teaching and learning activities.

Challenges of experienced

The challenges identified in this study are not unique UB and may be have to be addressed collaboratively with other Higher Education Institutions. Internally, all stakeholders at UB, (i. e. leadership, learners, academic staff, Information Technology department, and Educational Technology Unit), should work together to ensure that these challenges are addressed in order to make sure the process of technology integration is smooth and achievable. In terms of power cuts, UB should consider alternative methods of power such as solar power, generators, etc. to ensure that

electricity supply is always available at the institution. Effective ways of technology training should also be developed to address lack of ICT skills and knowledge gap expressed by instructors. The IT department at UB should consider linking together different computing systems and applications physically or functionally to provide the needed support. Currently, most systems at UB are like 'islands of processing systems'. For instance, there is no communication between Blackboard/Moodle and Enterprise Resource Planning (ERP) system. Ideally, when a student is registered into the ERP, that student should be automatically entered into his/her online course in Blackboard/Moodle. Bakar (2003) contents that organisations nowadays need a global, open and distributed computational capability for them to meet the demands of large scale and complex technologically-driven institutions like UB.

Conclusion

As alluded to earlier, this study was situated within the ICT for enhanced teaching conceptual framework. Within this framework, the study emphasized that for ICTs to enhance teaching, the instructors must be ready; ICTs and infrastructure must be available (Availability); instructors must adopt and integrate ICTs in their instructional activities (Uptake); and lastly, appropriate use of these technologies would have positive influence (Impact). The findings of this study have indicated that the majority of instructors at UB use ICTs available at the institution, albeit the prevailing technological challenges alluded to earlier, such as limited knowledge and skills in some of the available technologies, network problems, lack of technical support, and virus attacks. The findings have also suggested that instructors appreciate the role technology plays in teaching and learning processes. The study found that technology gives flexibility in the sense that it makes teaching and learning to become an interactive process; instructors can easily manage large classes; enable instructors to work from any place; has reduced pressure caused by limited time for face-to-face; enable instructors to come up with learning activities once which will always be available to the learners in future, as opposed to learners losing the activities printed on paper and one forced to re-print them.

It is therefore a good sign of technology transformation within UB regarding that instructors are using and appreciate the role technology plays in their instructional activities. The study further revealed that more needs to be done to encourage and support instructors to use technology in their instructional activities. The efforts expended by instructors should be recognized and integrated into their appraisals and promotion processes. However, to further improve on what UB is already doing, she needs to collaborate with other institutions by sharing best practices, experiences, and challenges in order to overcome some of those faced when trying to implement technology transformation. Furthermore, there has to be an increase in the use of blended learning and redesigning learning spaces not only to conform to the advancements in learning theories but to also conform to the new generation of learners using contemporary ICTs

Recommendations

1. Further research should be conducted to find out why some UB instructors are not keen in using communication and social networks in their instructional activities.
2. UB should come up with an eLearning workshops on Simulation and Gaming and make instructors aware of benefits of using these technologies in supporting curricular objectives.
3. UB should collaborate with other HEIs to share best practices, experiences, and challenges in order to overcome some of the problems they face when trying to implement technology transformations.

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