LECTURERS' USE OF WEB 2.0 IN THE FACULTY OF INFORMATION SCIENCE AND COMMUNICATIONS AT MZUZU UNIVERSITY, MALAWI

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ABSTRACT

The study reported on in this article investigated the use of Web 2.0 technologies by lecturers in the Faculty of Information Science and Communications at Mzuzu University (MZUNI), Mzuzu, Malawi. By distributing a questionnaire to 19 lecturers, conducting follow-up interviews with seven lecturers and analysing the curricula, the study showed that between 10 (58.8%) and 13 (76.5%) lecturers use Wikipedia, YouTube, blogs, Google Apps and Twitter to accomplish various

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academic activities, such as handing out assignments to students; receiving feedback from students; uploading lecture notes; searching for content; storing lecture notes; and carrying out collaborative educational activities. The study adopted the Decomposed Theory of Planned Behaviour (Taylor and Todd 1995) and the theory's elements that strongly affected lecturers' use of the technologies according to the results included attitude and perceived behaviour control. The study also found that poor Internet access remains the key stumbling block towards a successful adoption of Web 2.0 technologies by lecturers at MZUNI. To this end, the study recommends that the newly established Department of ICT Directorate with support from MZUNI management should install campus-wide Wi-Fi and improve Internet bandwidth so that lecturers' access to the Internet is not limited to their offices but rather is available in the teaching rooms across the campus.

KEYWORDS: Decomposed Theory of Planned Behaviour, Faculty of Information Science and Communications, higher education, lecturers, Malawi, Mzuzu University, students, teaching, Web 2.0

1. INTRODUCTION

Advancements in information and communications technologies (ICTs) have profoundly revolutionised higher education especially with regard to the delivery and presentation of lectures. Windschitl (1998) gives a far-sighted description about the role of the Internet and its associated technologies in higher education in the 21st century. He predicted that the World Wide Web (hereafter Web) would not only function as an information or content repository for learners and their lecturers but, among others, it could be transformed to present students and lecturers with innovative ways to instantly create, share, distribute and search educational content. Indeed, slowly but surely, web-based courses are replacing the face-to-face mode of course delivery. In South Africa, for example, Zinn (2009, 159) observes that ICT is gradually impacting the delivery of higher education through the emergence and adoption of online or e-learning programmes. What Windschitl (1998) predicted has become a reality: the recent emergence of Web 2.0 technologies is affording students and lecturers an opportunity to instantly create, share, distribute and search educational content. The challenge, however, is that over the past decades, educational researchers concentrated on understanding how the Web functions as the information and communication platform for learning and teaching. Yet since 2004, the Web has undergone major mutations in terms of its capability, access and functionality. To this end, some researchers (Greenhow, Robelia and Hughes 2009) have underscored the need to re-examine the role of the Web in higher education. In this study, the focus is on the use of Web 2.0 by lecturers in the Faculty of Information Science and Communications (ISC) at Mzuzu University (MZUNI), Mzuzu, Malawi.

Concerned with low human resource capacity in the country, MZUNI was established by the Malawi Government through an Act of Parliament in 1997 becoming the second public university, located in the Northern Region of Malawi (MZUNI 2015a). The university has registered a steady growth from one faculty, the Faculty of Education, to four more faculties, including: Environmental Sciences; Tourism and Hospitality Management; Information Science and Communications; and Health Sciences. In addition, the university has four centres, namely: the 'Centre for Open and Distance Learning, Centre for Water and Sanitation, Centre for Security Studies, and, the Testing and Training Centre for Renewable Energy and Technologies' (MZUNI 2015a). According to MZUNI (2015a), as of 2014, the university had 3 590 registered students, up from only 60 in 1998 when it had its first intake. In terms of academic staff, MZUNI (2015a) reports that the teaching staff grew from six in 1998 to 171 in 2014. The Faculty of ISC was established in 2004 to train high-quality library, information and communication technologies professionals for Malawi and beyond (MZUNI 2015a). The faculty has two departments, including Library and Information Science (LIS) and Information and Communication Technology (ICT), which offer degree programmes (undergraduate and postgraduate) in LIS and ICT, respectively.

Despite the lack of documented information about the status of ICT initiatives at MZUNI, one of the researchers, who works as a lecturer at MZUNI, observes that the university has made some strides in improving ICT infrastructure. The Faculty of ISC has two laboratories which together have 60 desktop computers and 30 laptops. The university also offers free computer and Internet services through the library to students and lecturers. The university has another three computer laboratories which are accessible by all students at the university. Over the years, the university has received ICT donations from various countries and organisations. For instance, Chaputula and Boadi (2010, 144) report that MZUNI has received computer hardware and Internet facilities from the Rockefeller Foundation, Japanese Government, American Embassy, and Malawi Government. The Japanese International Co-operation Agency (JICA) funded the installation of the wired local area network (LAN). In order to broaden access to ICTs and maximise their use in teaching and learning, MZUNI established the ICT Directorate in 2015 (MZUNI 2015b). According to MZUNI (2015b), the specific functions of the ICT Directorate include: network design; planning, installation and maintenance of ICT equipment; maintaining server functions for email, Internet, databases, file storage and administration; and end user ICT training, data management services and technical support services, just to mention some of the most notable ones.

Some researchers, such as Gaffar, Singh and Thomas (2011, 130), have raised an important concern over scepticism surrounding Web 2.0 use by stating that despite efforts being made by university administrators to invest in ICTs in African countries, lecturers have shown little interest in integrating them into their teaching and

learning. Thus, a band of researchers, such as Ajjan and Hartshorne (2008), Majhi and Maharana (2011), Mugwanya, Marsden and Boateng (2011), Brown (2012), Campion and Nailda (2012), Lwoga (2012), Zanamwe Rupere and Kufandirimbwa (2013) and Hartnett, Rosielle and Lindley (2015) have endeavoured to study the prospects, feasibility, absorption and applicability of Web 2.0 technologies in higher education institutions (HEIs) in the United States (US), India, South Africa, United Kingdom (UK), Spain, Tanzania, Zimbabwe and Pennsylvania, respectively. However, most of the studies mentioned were based on a case study design and it would be impractical to suggest that the findings can be applicable to lecturers in the Faculty of ISC at MZUNI, hence this study. After all, Flyvbjerg (2006, 224) reports that there are no theories and universals that can consistently predict the human affairs in different contexts, hence case studies are said to provide and produce concrete and context dependent knowledge of a phenomenon. In addition, economic development, which ultimately affects ICT development, varies from country to country. For example, the United Nations Development Programme (UNDP) Human Development Report (2014) indicates that Malawi is one of the poorest countries in the world and it is ranked 174 out of 182 on the Human Development Index.

Although a number of studies have been conducted to investigate the use of Web 2.0 technologies in education in some countries (Ajjan and Hartshorne 2008; Sarrafzadeh, Hazeri and Alavi 2011), the only known studies to have been conducted in Malawi in relation to the use of ICT in education are by Kadzera (2006) and Nyirongo (2009) who focused on the use of the Internet by lecturers. Although the Kadzera and Nyirongo studies are useful in demystifying the use of ICT in Malawian universities and colleges, they did not address the aspect of Web 2.0. Taking into account that MZUNI has taken some initiatives by investing in Internet technologies in the past decade (Nyirongo 2009; Chaputula and Boadi 2010; Mtingwi and Van Belle 2012), the present study bridges this gap by investigating how Web 2.0 technologies are being adopted by lecturers in the Faculty of ISC at MZUNI. The study was thus conducted with the purpose of demystifying the use of Web 2.0 technologies by lecturers in the Faculty of ISC. The main objective was to reveal if Web 2.0, which is proven to have a profound impact on teaching as reported by other researchers, has a similar impact on MZUNI's lecturers, particularly those in the Faculty of ISC. The study sought to investigate how Web 2.0 technologies are being utilised in the Faculty of ISC. The study answered the following four specific questions:

- What is the current awareness of and familiarity with Web 2.0 technologies amongst lecturers in the Faculty of ISC?
- For what educational purpose do lecturers in the Faculty of ISC use Web 2.0 technologies and which Web 2.0 technologies do they use most?
- What do lecturers in the Faculty of ISC perceive as benefits of Web 2.0 technologies?

- What are the factors that influence lecturers in the Faculty of ISC to adopt Web 2.0 technologies?

2. WEB 2.0 DEFINED

Until a decade ago, the 'first-generation Web' now commonly described as Web 1.0 (Cormode and Krishnamurthy 2008) was based on the restrictive one-way communication models where experts presented their material to an audience perceived to be expectantly captive (Kwanya, Stilwell and Underwood 2012). This implies that in the Web 1.0 era, users simply browsed, read, and extracted information. To engage users of the Web, the second generation of the Web or Web 2.0 was subsequently developed in 2005 by O'Reilly thereby transforming the predominantly 'read-only' or Web 1.0 into a 'read-and-write' Web. Unlike Web 1.0, Web 2.0 has been characterised by Kwanya, Stilwell and Underwood (2012) as a definite Web feature that makes the Internet more sociable and real and, it is a framework on which social media tools such as MySpace, blogs and Facebook were developed. Web 2.0 is known by various names which fundamentally emerge as a result of its characteristics and some of them include 'participatory media' (Bull et al. 2008, 106), 'social digital technologies' (Palfrey and Gasser 2008) and 'second wave of the World Wide Web' (Azab, Abdelsalam and Gamal 2013). Examples of some popular and widely used Web 2.0 technologies include blogs, wikis, Real Simple Syndication (RSS) feeds, YouTube, Flickr, Facebook, Twitter, Skype, podcasts and Google Apps (Armstrong and Franklin 2008; Hough and Neuland 2012). The adoption of these technologies by universities has brought about appealing and efficient ways of carrying out teaching and learning activities. A trio of researchers (Sarrafzadeh, Hazeri and Alavi 2011) is convinced that technologies such as blogs, Twitter and Facebook facilitate sharing of ideas, re-use and publication of study content and also provide commentaries and links to relevant information resources that lecturers and students need most. The use of Web 2.0 technologies is beneficial for LIS schools because the library work place is increasingly becoming a digital environment. For example, Web 2.0 technologies are being used by librarians to facilitate access to information, information transfer and to promote knowledge sharing amongst library staff and clients (Grosseck 2009, 478).

3. LITERATURE REVIEW: WEB 2.0 USAGES AMONGST ACADEMIC STAFF

This section seeks to identify connections, contradictions and gaps in the literature in relation to the use of Web 2.0 in higher education. The literature is reviewed according to four themes which include awareness of and familiarity with Web 2.0,

purposes of Web 2.0 and dominant Web 2.0 technologies, benefits of Web 2.0 and factors for use and non-use of Web 2.0.

3.1. Awareness of and familiarity with Web 2.0

It is noticeable in the literature that the permeation of Web 2.0 technologies into higher education is affected by students' and lecturers' awareness and familiarity with these technologies and emphasis has been on the need for researchers interested in the use of technologies to pay attention to issues of awareness and familiarity. In one study, Majhi and Maharana (2011) set out to study the familiarity of Web 2.0 technologies amongst academic staff, students and researchers at Utkal and Sambalpur Universities in India. The two researchers report that most of the university community had the necessary knowledge and application of certain Web 2.0 technologies particularly Facebook, wikis and Twitter which had their levels of awareness pegged at 98%, 95% and 91% respectively. However, the same study reveals that lecturers and students lacked the necessary knowledge and skills in using some Web 2.0 technologies that could equally be used in higher education. For instance, RSS feeds, blogs, and social bookmarking which are reported by other researchers (Ajjan and Hartshorne 2008, 74; Azab, Abdelsalam and Gamal 2013) as having huge potential for educational purposes, registered a low use amongst the university community attributing such a development to lack of familiarity. A related study of 46 lecturers in Spain by Rubio, Martín and Morán (2010) also reveals that the use of Web 2.0 applications such as blogs, wikis and podcasts are somehow overlooked in teaching at the Gijo´n EUITI University due to lack of awareness amongst academic staff and students.

It is evident from the literature that in the 21st century, there has been increased interest in the use of podcasts which promise improvements in the delivery, participation, knowledge acquisition and retention in the academic field. Mugwanya, Marsden and Boateng (2011) investigated the academic staff's and students' experience in podcasting at the University of Cape Town (UCT) in South Africa focusing on identifying the current experiences, familiarity and knowledge. The researchers report that lecturers lack necessary knowledge and experience in podcasting and consequently, they have a perception that podcasts do not provide much needed value in the teaching and learning process. These findings are corroborated by Ping and Issa (2011) who conducted a longitudinal study to investigate the awareness and knowledge of Web 2.0 technologies amongst undergraduate students, lecturers and tutors at the Curtin Business Information Systems in Australia. The researchers compared the post-survey results with pre-survey results and they found that the levels of awareness and knowledge of lecturers using Web 2.0 were low at the beginning of the semester, with a slight increase in the levels of awareness and knowledge as the students were exposed to several Web 2.0 technologies. This

implies that exposing lecturers to Web 2.0 technologies is an important aspect for the successful adoption of these technologies in higher education.

3.2. Purposes of and most popular choices for Web 2.0

Web 2.0 is used for various purposes and it brings about several benefits for academics (Al-Qirim 2010). In Egypt, Azab, Abdelsalam and Gamal (2013) investigated the use of Web 2.0 by academic staff in public universities and findings show that a high number of lecturers use Web 2.0 such as blogs, wikis and social networks for collaboration in research activities and sharing academic content. It is very clear from the literature that the academic activities reported in Egypt are also commonly performed by academic staff and students in Australia. Ping and Issa (2011) report that most lecturers and students at Curtin Business Information Systems in Australia use Web 2.0 technologies to organise group meetings, to communicate with other classmates and to communicate with their tutors. In summary, three main purposes of Web 2.0 in a university environment are noted from the literature as follows:

- To communicate classroom and research activities: Primarily, communication could be amongst lecturers themselves, lecturers with students or student with other students (Eyyama, Menevis and Dogruer 2011, 2660). Lecturers use technologies such as Twitter, wikis and podcasts in giving course work, assignments and feedback to students while students use these technologies to submit assignments and to seek clarifications from their friends and instructors.
- To keep up-to-date on topics of interest: This is made possible by group subscriptions to Facebook and Twitter accounts and use of bookmarks which enable users in the academic world to save the pages that interest them. RSS feeds incorporated into blogs, wikis and Websites bring the current affairs in a particular topic of interest. For example, RSS feeds enable learners to stay more attuned to friends or world events through the range of multimedia information posted (Greenhow, Robelia and Hughes 2009).
- To make professional contacts: For example, Greenhow, Robelia and Hughes (2009), Zanamwe, Rupere and Kufandirimbwa (2013, 9), Hartnett, Rosielle and Lindley (2015) claim that one aspect of social media in which individuals in university communities benefit is to share ideas, interests, or meet people with similar professional ideas and interests

3.3. Benefits of Web 2.0

The potential benefits of Web 2.0 for teaching purposes from the academic staff's perspective are highlighted in various studies and scholarly articles. Al-Qirim

(2010) set out to develop a framework for governing Web 2.0 implementation in teaching and learning in the US. By reviewing published literature in relation to Web 2.0 in teaching and learning as a data collection method, the researcher identified several benefits of Web 2.0, namely: reduction of costs and time; easier and faster access to information when it is needed; and facilitated sharing of accumulated experiences through blogs, micro-blogs, wikis, Flickr and YouTube. Similar findings have been reproduced in the UK. Brown (2012) conducted a study that explored academics' perceptions of the potential benefits of Web 2.0 in their teaching contexts at a research-intensive university. The researcher identified several benefits which include: improved discussions and sharing of research ideas and resources amongst staff and students; improved presentation of students' work for assessment purpose using wikis and blogs; improved students' participation in the learning process through group based projects using wikis; facilitated distribution of lecturer generated content; and facilitated news provision to students through built in RSS feed facilities in blogs and wikis. However, despite the benefits associated with the use of most Web 2.0 technologies in the UK, a recent study in the same country by Prescott (2014) showed that 63 per cent of faculty/educators do not want to use Facebook for teaching purposes in their course. The fact that Brown's (2012) study does not mention Facebook leads us to conclude that Facebook is not favoured for use in higher education in the UK. A summary of the key benefits of Web 2.0 technologies in higher education as uncovered from a synthesis of the literature is as follows:

- A noticeable increase in communication and collaboration amongst students and lecturers both in class and online (Ajjan and Hartshorne 2008, 74). Here, students become more engaged in debates and discussions, as they have greater opportunities to contribute, and get to know each other via their online interactions.
- Web 2.0 helps students to develop more independent learning skills, confidence and become co-producers of class knowledge and content (Al-Qirim 2010) and it enables students to seek help and support outside of normal class room hours from each other and from lecturers (Brown 2012).
- Web 2.0 enables students to easily follow current events and integrate them into their discussions and assignments, and instantly engage online with people involved in the topic area (Luckin et al. 2009, 95; Tyagi 2012, 30). This is important because it enables students to validate their learning in the wider context of what is happening at that very moment in the world outside of the classroom as references, links and resources can easily be shared.

- Farkas (2012, 85) suggests that Web 2.0 gives students a chance to express their opinions online without the impediments of limited class time, lack of confidence because of shyness, or different levels of verbal proficiency and cultural difference.

3.4. Factors for use or non-use of Web 2.0

Since the term Web 2.0 was coined in 2005 by O'Reilly, researchers have been conducting empirical studies to understand issues that influence academic staff either to use or not use various types of Web technologies. Issues, including ease of use, usefulness, compatibility, availability of resources and social pressures are some of the dominant factors that have been studied in how they affect the use and non-use of these technologies. Campion and Nailda (2012) conducted a predominantly qualitative study at two Spanish universities on the use of Web 2.0 and the results show that lack of necessary skills scares the lecturers from using these technologies. So it is clear to see that lecturers perceive Web 2.0 applications as difficult to use hence, their unwillingness to adopt them. On a positive note though, the same study reveals that some lecturers use Web 2.0 technologies because they are of the view these technologies enable them to perform their teaching activities effectively. This seems to paint a picture that lecturers use Web 2.0 technologies because these technologies add value (perceived usefulness) to their teaching and learning activities. Similar findings have been reported by Daher and Lazarevic (2014) who investigated the types, dynamics and challenges of Web 2.0 technologies used by lecturers and the results showed that lack of training opportunities was identified as the main barrier for using Web 2.0 technologies. In Tanzania, Lwoga (2012) analysed the challenges affecting the application of e-learning and Web 2.0 in public universities and the researcher found that the adoption of Web 2.0 technologies is still in its infancy stages due to factors that are also reported by Gaffar, Singh and Thomas (2011) and they include poor technological infrastructure, prohibitive cost of Internet technologies and unreliable electricity. It appears that electricity and poor Internet infrastructure are common in most African countries including Malawi. Nyirongo (2009) conducted a case study about the adoption of ICTs by lecturers at MZUNI and noted that electricity and poor Internet connectivity were the major hindrances that inhibited the integration of ICTs into academic activities.

4. THEORETICAL FRAMEWORK: DECOMPOSED THEORY OF PLANNED BEHAVIOUR

It is clear from the literature that some theories have been used to understand the acceptance and rejection of Web 2.0 technologies by lecturers. These researchers find

it reasonable to use the Decomposed Theory of Planned Behaviour (DTPB) (Taylor and Todd 1995) which, according to the literature reviewed in the preceding section, is one of the theories commonly used by most researchers. Taylor and Todd (1995) laid a very good foundation for understanding and studying rejection and acceptance of technological innovations through the DTPB. The theory has been adopted because some researchers (Ajjan and Hartshorne 2008; Mugwanya, Marsden and Boateng 2011) have endeavoured to shed more light on how the DTPB influences the acceptance and rejection of Web 2.0 in education settings. Regardless of the nature of the technology, Taylor and Todd's model depicts the adoption of an innovation as affected by three major factors: attitude, subjective norms and perceived behaviour control.

In terms of attitude, Taylor and Todd (1995, 155) postulate that if individuals have positive perceptions towards a particular technology, they are likely to accept it; whereas if they have negative perceptions towards the innovation, they are unlikely to adopt it. Three factors in relation to attitude include perceived usefulness, ease of use and compatibility. Perceived usefulness is defined as the degree to which an individual believes that a technology can improve their job performance (Davis 1989, 320). In this case, lecturers are likely to accept Web 2.0 technologies if they have a perception that these technologies can add value to their teaching activities. Ease of use represents the degree to which an innovation is easy to understand and operate (Rogers 2003, 70). The implication is therefore that if lecturers perceive the Web 2.0 applications as user friendly, they are likely to accept and incorporate them in their educational activities. Compatibility refers to the degree to which a technology fits with the potential existing values and experiences (Rogers 2003, 72) implying that lecturers will accept and use these technologies if they marry well with their existing teaching practices. Subjective norms refer to the social pressures that make an individual perform a particular behaviour (Ajzen 1991, 202). For example, lecturers can be influenced by fellow lecturers, their heads of departments/deans of faculties or students to start using Web 2.0 applications in teaching. Perceived behaviour control consists of two aspects. Firstly, Taylor and Todd (1995, 156) point out that individuals are likely to accept and use the technology if they are themselves comfortable using it (self-efficacy). Secondly, lecturers are likely to accept Web 2.0 technologies if there are favourable conditions or facilitating conditions. Examples of facilitating conditions in this case may include time and money (resource facilitating condition), computers and strong Internet bandwidths (technology facilitating condition). Figure 1 depicts the DTPB model.

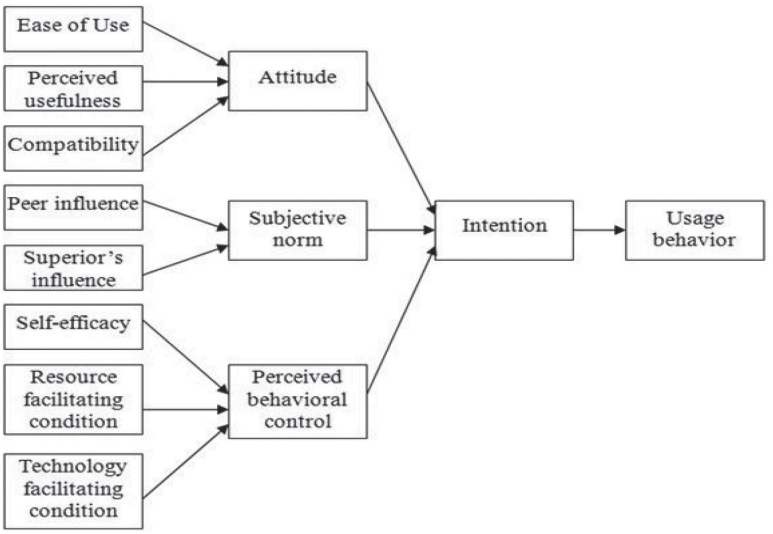

Figure 1: The Decomposed Theory of Planned Behaviour (Taylor and Todd 1995, 163)

5. RESEARCH DESIGN AND METHODOLOGY

The study was part of a larger research which included students and lecturers in the Faculty of ISC at MZUNI but here, the focus is on the lecturers. There were 19 lecturers in the Faculty of ISC of whom ten (nine males and one female) were from the LIS department whereas nine (eight males and one female) were from the ICT department. All lecturers in the faculty possess basic ICT skills which enable them use computers and the Internet. All lecturers access the Internet free of charge in their offices. Worth mentioning is that lecturers in the ICT department have better ICT knowledge and skills than lecturers in the LIS department because the former are ICT specialists by profession whereas the latter are LIS professionals.

The researchers adopted a case study design whose value is that it helps researchers to understand the impact and influence that the organisational and environmental context is having on and influencing social processes (Hartley 2004, 325). By adopting this approach, the researchers were able to fully gather in-depth data so as to holistically understand the use of Web 2.0 by lecturers. The core strength of a case study approach hinges on its ability to accommodate mixed data collections procedures and techniques to make inferences through a process referred to as triangulation in the research community. McMillan (2004) notes that through

triangulation, qualitative and quantitative data are collected almost simultaneously to take advantage of the strengths of either method and at the same time to offset the weaknesses of the other. The researchers identified the participants based on three criteria: the researchers wanted participants who had been exposed to various Internet technologies and those who were aware of various Internet access points on MZUNI campus or outside the campus. Based on the knowledge and experience of one of the researchers as a lecturer in the faculty, the researchers were of the view that all lecturers met the criteria, and consequently, all 19 lecturers were included in the study. This means that the said participants had 'particular features, capabilities and characteristics' (Saunders, Lewis and Thornhill 2002, 78) which enabled a detailed exploration and understanding of central themes and puzzles about the use of Web 2.0 technologies by lecturers in their activities.

The study gathered qualitative and quantitative data using various data collections procedures. The researchers sent a Web-based questionnaire to 19 lecturers. The questionnaire consisted of closed-ended and open-ended questions. The researchers also analysed the curricula of the faculty using content analysis. Content analysis is a detailed and systematic examination of the contents of a particular body of material in order to identify patterns, themes or biases (Leedy and Ormrod 2005, 142; Neuman 2006, 322). The researchers analysed the content of 43 LIS department courses and 44 ICT department courses. Documents such as course outlines, lists of references and assignments for each of the courses were analysed to help the researchers obtain a detailed understanding about the use of Web 2.0 technologies in the faculty. Interviews are usually very useful as a follow-up to questionnaires to further investigate responses (McNamara 1999). Thus, in the study, interviews were conducted with the lecturers to unravel inconsistencies that were identified after analysing the data collected from lecturers using a Web-based questionnaire and through analysing the faculty's curricula. The interviews conducted with seven lecturers allowed for clarification on some concepts. The quantitative data from the questionnaires was analysed using the Statistical Package for the Social Sciences (SPSS); while the qualitative data was analysed thematically. Braun and Clarke (2006) define thematic analysis as a method for identifying, analysing and reporting patterns (themes) within data. In the current study, commonly recurring and prevalent themes were identified and used in answering the research questions. The researchers triangulated the questionnaire data (predominantly quantitative), curricula analysis and interview data (entirely qualitative).

6. DATA PRESENTATION AND DISCUSSION OF FINDINGS

A Web-based questionnaire was sent to 19 lecturers, of whom 17 (89.4%) responded. The findings are presentenced and discussed according to the following themes:

- awareness of and familiarity with Web 2.0 technologies;
- purpose of Web 2.0 technologies and Web 2.0 technologies used most;
- benefits of Web 2.0 technologies in teaching; and
- factors for use and non-use of Web 2.0 technologies.

6.1. Awareness of and familiarity with Web 2.0 technologies

The researchers provided the lecturers with a list of Web 2.0 technologies from which they were required to select the ones they knew. Between 11 (64.7%) and 17 (100%) lecturers were aware of Facebook, Twitter, Wikipedia, LinkedIn, Dropbox, podcasts, RSS feeds, Flickr, blogs, YouTube, Skype, WhatsApp and Google Apps. Only seven (41.2%) lecturers were aware of Delicious and Picasa, and eight (47.15%) were aware of Viber. All lecturers were aware of LinkedIn because most professionals including lecturers have accounts with LinkedIn where they display their résumé to remain visible so that potential employers can see their accomplishments, experiences and skill sets. After all, LinkedIn (2014) claims that it is 'the world's largest professional network' boasting '300 million members in over 200 countries and territories around the globe'. The proliferation of smartphones in Malawi has contributed significantly to lecturers' awareness of the technologies mentioned because most phones, especially smartphones have these technologies either pre-installed or can be installed as per the wish of the users. The other reason is attributed to the fact that some of these technologies such as Twitter, Wikipedia, RSS feeds and Google Apps are contained in some courses that lecturers teach as revealed in the curricula. These findings align with those reported in the US by Ajjan and Hartshorne (2008) who also found that a good number of lecturers were aware of blogs, RSS feeds and most social networks.

Overall, lecturers possess adequate knowledge and skills for using most Web 2.0 technologies. In terms of the ability to use Web 2.0 technologies, Figure 2 reveals that they (lecturers) adopted these technologies because, according to the DTPB, individuals are likely to adopt any innovation if they find it easy to understand and operate. Lecturers are normally well read, more informed and possibly more innovative and it is usually easy for them to learn some of these technologies independently. Being teachers, lecturers are expected to be more knowledgeable and innovative. The majority of lecturers (percentages ranging from 52.9 to 88.4) are 'very competent' or 'competent' in using Facebook, Skype, YouTube, Google Apps,

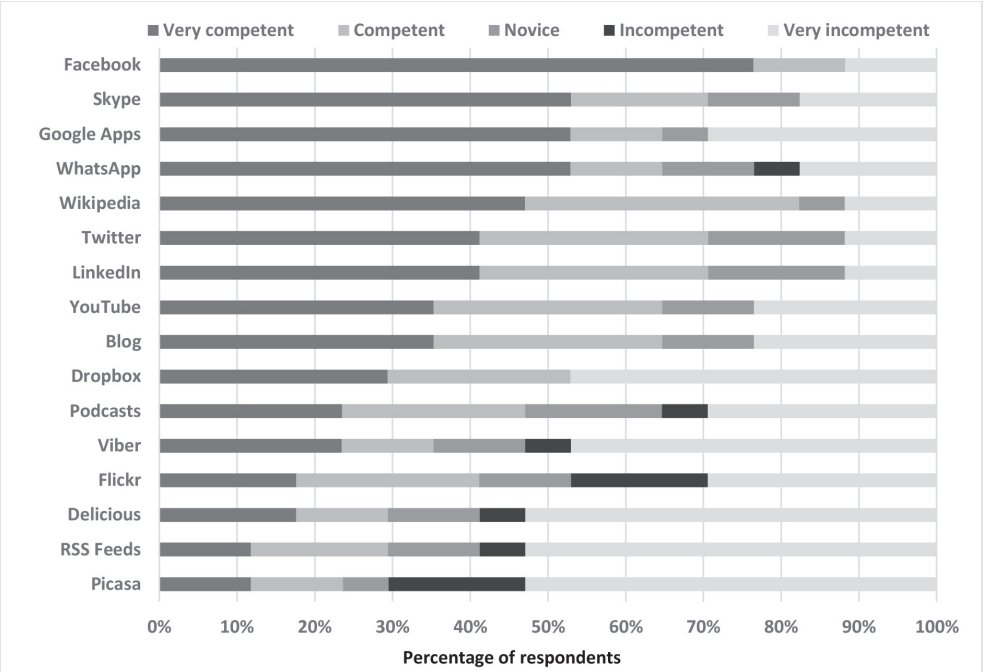

Figure 2: Lecturers' proficiency with Web 2.0 technologies (N = 17)

6.2. Purpose of Web 2.0 technologies and Web 2.0 technologies used most

Two open-ended questions and one closed-ended question solicited data from lecturers about the general and specific academic activities they performed using Web 2.0 technologies and the common Web 2.0 technologies they used to perform academic activities. The aim was to note the relationship between the use of Web 2.0 in personal activities and in academic work. A question on which Web 2.0 technologies were most used for academic work was asked to establish the relationship between the awareness and familiarity and the actual use in academic activities. The study established that in general, lecturers cited several activities they performed using Web 2.0 technologies including: chatting with friends; teaching; multimedia sharing; current affairs on political issues; and hunting for jobs. The results suggest that apart from using Web 2.0 technologies for personal reasons, the lecturers also use these technologies to accomplish educational activities. Specifically, lecturers use some Web 2.0 technologies to perform several academic activities which include: handing out assignments to students; receiving feedback from students; e-learning; uploading lecture notes; searching for content; receiving feeds on various subjects; preparing

lecture notes using Google Apps; using Wikipedia to search for information; using YouTube videos to enhance concept explanation; using Delicious to tag information related to topics being taught and sharing it with colleagues; and using Dropbox to store lecture notes and scheduling activities using Google Calendar.

These questionnaire responses are supported by information gathered from the curricula and from the interviews. An extract from the curricula and a quotation from the interviews that follow all signify that Web 2.0 technologies are indeed used for academic purposes by lecturers. Using a digital camera/video camera and Windows Movie Maker, each group should create a video … upload the video on YouTube and its sound version on Sound Cloud, tweet the video and the audio and then share the video and the audio to all members of the class using Google+. (Multimedia module: ICT 1203) and 'Well, I actually use Google Apps as a platform for making sure that my students are engaged in collaborative learning. When I administer an assignment via Google Drive, I usually tell students that I can only mark their assignments if they send me using the same platform. If it is a group work, I also advise them to use Google Apps' (Lecturer 1, ICT department). Eyyama, Menevis and Dogruer (2011, 2660) observe that one key area where Web-based technologies are predicted to have a significant impact is their ability to transform the way in which professors and students are able to communicate and interact with one another. In the present study, an analysis of the questionnaire, the curricula and the interviews data all strongly reveal that lecturers use Web 2.0 technologies to send assignments, lecture notes and to provide feedback to students.

The results from the questionnaire, curricula analysis and interviews indicated that there are several types of Web 2.0 technologies which lecturers commonly use to accomplish various academic activities. Between ten (58.8%) and 13 (76.5%) lecturers use Wikipedia, YouTube, blogs, Google Apps and Twitter. The questionnaire findings are validated by the findings from the curricula and interviews which show that Wikipedia, Google Apps and YouTube dominate in the accomplishment of academic activities. Admittedly, most scholars including lecturers typically 'use Wikipedia as a starting point to search for a topic which is new to them' (Luckin et al. 2009, 95) whilst Google Apps in this case offer lecturers the most convenient, customisable and flexible platforms to virtually meet and share ideas, store their data and schedule their activities using Google Documents and Google Calendar respectively. Similar findings are reported by Daher and Lazarevic (2014, 46) at Midwestern Community College where Google sites, Google Documents and podcasting are commonly used in education in that order. These diverse uses of Google Apps and Wikipedia are seen as what Taylor and Todd (1995) claim in their DTPB model fall within the aspects of compatibility and perceived usefulness and are decisive in the adoption of any technology or innovation.

The study revealed further that some Web 2.0 technologies such as Facebook and Skype, which lecturers have indicated they are aware of and possess the necessary

skills for operating, have turned out to be used on a very small scale in performing academic activities. Ironically, the results align and contrast with some studies. Unlike the current study's findings, Campion and Nailda (2012) report that Twitter and Facebook are the Web 2.0 technologies mostly used by the academic staff in Spanish universities to achieve their educational activities. The reason for the low use of Facebook by lecturers in the present study is that these technologies especially Facebook are regarded as too informal to be used for academic purposes in Malawi. Most lecturers supported the statement made by one of their colleagues that 'I don't use Facebook because I think it is too social' (Lecturer 5, LIS department) and such a statement depicts the gravity of misconceptions that lecturers hold about Facebook which other studies in Zimbabwe (Zanamwe, Rupere and Kufandirimbwa 2013) and Pennsylvania (Hartnett, Rosielle and Lindley 2015) have proven to be suitable for teaching in higher education.

6.3. Benefits of Web 2.0 technologies

Evidence emerged from the preceding section that lecturers have adopted and integrated some Web 2.0 technologies in their educational activities implying that there are benefits associated with their use. The researchers asked lecturers to indicate the extent to which they agreed with the benefits listed in Table 1 about Web 2.0 technologies in education. It is clear that between 13 (76.4%) and 15 (88.4%) lecturers 'strongly agree' or 'agree' with all the benefits that are listed. Lecturers were asked further to cite other benefits apart from those listed in Table 1 and some of their views are as follows: 'help me search for information'; 'Web 2.0 technologies help me explain difficult concepts by using videos uploaded on YouTube'; 'help my students to participate actively through interactivity exercises offered by some technologies such as wikis and Google Documents'; 'help me receive instant feedback from students and colleagues'; 'facilitate storage and ease of retrieval of the materials. For example, using Dropbox to store lecture notes'; 'help my students to learn at their own pace anytime'; and 'help my students communicate anytime regardless of physical barriers'.

Table 1: Benefits of Web 2.0 technologies in teaching and learning (N = 17)

Benefits	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Web 2.0 helps me improve my skills in using technology.	13	76.5	2	11.8	1	5.9	0	0	1	5.9
Web 2.0 facilitates collaborative learning.	13	76.5	3	17.6	0	0	0	0	1	5.9

Benefits	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Web 2.0 helps me keep updated in my research field.	11	64.7	6	35.3	0	0	0	0	0	0
Web 2.0 helps me to communicate with students beyond classroom hours.	10	58.8	4	23.5	1	5.9	0	0	2	11.8
Web 2.0 improves knowledge sharing and collaboration.	10	58.8	7	41.2	0	0	0	0	0	0
Web 2.0 improves teachers' interdepartmental communication.	8	47.1	6	35.3	2	11.8	0	0	1	5.9
Web 2.0 helps me save time and costs (i.e. travelling is less necessary).	10	58.8	3	17.6	1	5.9	1	5.9	2	11.8

In summary, the questionnaire, curricula and interview data support each another and it emerges that lecturers reap five main benefits from Web 2.0 technologies: they facilitate the search for information, they facilitate lecturer to lecturer and lecturer to student communication, they make teaching easier aided by YouTube, they facilitate the storage of teaching resources, such as lecture notes, and they eliminate distance as a barrier to collaborative learning. These findings confirm those reported by Campion and Nailda (2012) who found that more than half of the professors in some Spanish universities are of the view that Web 2.0 technologies have high potential to enhance and improve teaching and learning in HEIs through increased student lecturer communication, increased interaction between academic staff and students and increased student to student interactions within the department. The questionnaire results corroborate the curricula results where it has been noted that lecturers use some Web 2.0 technologies such as Google Apps and YouTube to carry out teaching and learning activities. One of the following extracts from the curricula (Programming in Pascal: ICT 1401) reads: 'You can learn more about Delphi and Lazarus development environments by watching a YouTube video available at: https://www.youtube.com/watch?v=ugL4buACucw.' It is clear that by using YouTube as a teaching resource lecturers perceive it as useful and are therefore motivated to adopt it according to the DTPB. The fact that the present study has realised similar findings to those reported elsewhere across the world uphold the views by Windschitl (1998) who far-sightedly predicted that in the 21st century, the Internet and its associated technologies [Web 2.0] would present students and lecturers with innovative ways to instantly create, share, distribute and search educational content.

The benefit of time and cost saving is more pronounced in this study vis-à-vis other similar studies. Google Apps, Twitter and Black Berry Messenger (BBM) are the main technologies that have been noted to visibly help lecturers save their time and some would-be costs. The aspect of BBM only arose during the follow-up interviews with lecturers as it was not part of the technologies which were dealt with in the questionnaire. The fact that most Malawians and including lecturers own BlackBerry smartphones which have their subscription affordable explains why it is preferred by lecturers than other technologies such as WhatsApp and Twitter. Time is a precious resource for lecturers who are preoccupied with teaching, marking, conducting research, supervising research projects of undergraduate students, attending conferences and attending departmental and faculty meetings. Thus, these technologies improve efficiency in communication and do away with costs that could have been incurred in making phones calls which, according to Mtingwi and Van Belle (2012), are said to be expensive in Malawi. BBM and Twitter provide alternative communication conduits which are convenient and cost-effective to instantly send messages to the intended recipients with the click of button. Such a characteristic of Twitter, WhatsApp and other Web 2.0 technologies explains the reason why lecturers demand students to send feedback to them as supported by some of the following extracts from the Web Design (ICT2402) and Computer and Communication Technology (ICT1103) modules respectively: 'Find ***five*** websites on the Internet about qualities of good websites and tweet on my account (@******) before 8th May, 2014' and 'If you have any problem please text or send me a WhatsApp message on +265*********'. Google Apps provide lecturers with the most conducive and innovative options for enhanced storage and retrieval of academic materials such as lecture notes, provide the best mode of administering exercises to students and offer one of the finest, innovative and reliable platforms for collaborative learning so much so that one lecturer commented that: 'Normally, I use Google Apps or Google Drive because with this application, you can do whatever you want, like creating a Google Document, sending an assignment to students anytime and instantly providing students the feedback' (Lecturer 1, ICT department).

The results from the questionnaire indicated that lecturers support this statement made by one of their colleagues which reads: '[Students should be introduced to Web 2.0] to prepare them for work places as technology is becoming a must.' This is an indication that there is general consensus from lecturers that students should be exposed to Web 2.0 technologies with a belief that in doing so the students are readied for their future employment demands. This is the reason that some Web 2.0 technologies such as blogs, YouTube, Wikipedia and RSS feeds are embedded in the curricula. That is to say, according the DTPB, lecturers envisage the usefulness of Web 2.0 in the future undertakings of their students, hence the need to adopt them. Such an observation has been made before by some researchers in Iran. Upon assessing the knowledge and use of Web 2.0 technologies by academic staff in

Iran, Sarrafzadeh, Hazeri and Alavi (2011) report that lecturers are of the view that integrating Web 2.0 in higher education helps prepare students for Library 2.0. In this context, Library 2.0 is described by Kwanya, Stilwell and Underwood (2012) as the application of Web 2.0 tools to conceptualise the delivery of library services by offering user-centric services anywhere, anytime, anyhow.

6.4. Factors for use and non-use of Web 2.0 technologies

As discussed in previous sections, lecturers in the Faculty of ISC have made some headway in the adoption of Web 2.0 technologies. Nonetheless, most technologies are yet to be integrated in teaching. The researchers investigated several factors that motivate and discourage lecturers from adopting or not adopting these technologies. Results from the questionnaire indicate that between 13 (76.5%) and 15 (88.4%) lecturers use these technologies because they are personally comfortable using them, have knowledge and ability to use Web 2.0 technologies, access them for free and also because Web 2.0 technologies fit well with their educational activities. Looking through the lens of the DTPB model, it is possible to explain how attitude (compatibility, perceived usefulness and ease of use) propels lecturers into using Web 2.0 technologies. In their model, Taylor and Todd (1995) argue that individuals are likely to accept a technology if it fits with their existing values and experiences and also if individuals believe that the technology can improve their job performance. In the present study, lecturers have accepted these technologies because they marry well with and add value to their existing teaching practices. For example, collaborative learning, communication, storing of data, searching and sharing of information are some of the routine activities that lecturers already performed before the advent of Web 2.0 technologies. In other words, these technologies have easily fitted (compatibility) into the already existing academic activities of lecturers while at the same time, the technologies have improved (perceived usefulness) the accomplishments of the academic activities mentioned.

The results of the study suggest that the level of adoption of Web 2.0 technologies for teaching purposes is not satisfactory. In fact, only a few lecturers indicated that they have ever used Facebook, RSS feeds, podcasts, Skype, Twitter, LinkedIn, blogs, Picasa, Flickr, Viber, Delicious and Dropbox in their educational activities. This is despite lecturers using some of these technologies such as Facebook and LinkedIn to accomplish personal activities. Some researchers (Armstrong and Franklin 2008; Tyagi 2012) have cautioned that the sheer number of Web 2.0 technologies which have overlapping functionalities means that it can be difficult for students and lecturers to know which ones to use. Similarly, the findings of the present study have established that lecturers are faced with a similar challenge. The following statement made by one of the lecturers during the interviews explains the seriousness of this challenge:

> Even myself [I] do no use most of these technologies because they are too many. Worse still they perform similar functions. Why should I install Viber and Skype on my BlackBerry phone when I can use BBM in their absence? (Lecturer 7, LIS department)

Indeed, Web 2.0 technologies such as Skype, BBM, Viber and WhatsApp mimic each other's functionalities so are Google Drive and Dropbox. It is therefore not surprising that the present study found this to be a mitigating factor.

Interviews with lecturers revealed that blackouts are also a problem at MZUNI but the proliferation of smartphones have nullified this problem by allowing lecturers access to Web 2.0 technologies when there is no electricity. For instance, some lecturers commented that: 'But what I know is that at MZUNI, in Malawi and many other parts of Africa, electricity is a major problem' (Lecturer 2, LIS department) and '… there are so many blackouts [at MZUNI] within a day' (Lecturer 7, LIS department). The fact that Nyirongo (2009) noted the same problem implies that the problem of electricity outages at MZUNI has not been dealt with. Electricity has been reported as one of the key factors hampering the adoption of Web 2.0 in other African universities. For example, Lwoga (2012) assessed the extent to which Web 2.0 technologies were utilised to support teaching and learning in some Tanzanian universities and the study equally indicates that electricity is one of the major problems hindering the successful adoption of Web 2.0 technologies in teaching and learning. In a similar study, Gaffar, Singh and Thomas (2011) found that poor infrastructure including low Internet bandwidth, lack of technical support and high cost of Internet connectivity are the major barriers that inhibit the use of Web 2.0 technologies in teaching and learning at the Caribbean University. Similarly, though not as pronounced, this study has revealed that Internet problems stymie the adoption of Web 2.0 technologies by lecturers. Slow Internet and the absence of Wi-Fi prompted one of the lecturers to comment that:

> I would think that it [some lecturers said they usually teach without these technologies] is because we have some challenges such us the unreliability of the Internet at MZUNI. So some lecturers may feel that it's better to teach without these technologies because if I try to use them, the Internet may disappoint. (Lecturer 1, ICT department)

7. CONCLUSION AND RECOMMENDATIONS

The study has put into perspective the use of Web 2.0 technologies at a university which is located in one of the world's poorest countries according to the UNDP Human Development Report (2014) and where Internet technologies are just beginning but promisingly thriving and proliferating. Generally, the study has demonstrated that, despite the perceivable challenges associated with Internet technologies, lecturers have adopted some Web 2.0 technologies in their academic activities.

Specifically, the researchers have drawn four main conclusions based on the findings of the study. Firstly, most lecturers know about the plethora of Web 2.0 technologies which could be used in education, thanks to the proliferation of smartphones which support many of these technologies and also because of their inclusion in the curricula. Lecturers are not only aware of Web 2.0 technologies but also possess technical skills for using some of these technologies. Secondly, regardless of the scale of use, the bottom line is that all lecturers use some of these technologies to carry out their academic activities. Clearly, Web 2.0 technologies have proved worth adopting as they are being used by lecturers to search for valuable information or content, communicate and to conduct collaborative learning. Most lecturers predominantly use Wikipedia, Google Apps, YouTube, WhatsApp, BBM and Twitter. Thirdly, Web 2.0 technologies come along with a wealth of opportunities and benefits in higher education that lecturers are already exploiting by evidently adopting some of these technologies. Diverse benefits revealed from the study include quick and cheap communication, easy access to information, 24/7 collaborative learning and enhanced self-learning at one's convenience and pace. Finally, the DTPB, a model on which the study is based, has reliably provided meaning to the reasons that affect the use of Web 2.0 technologies for academic purposes. Whereas two attributes of the DTPD namely, attitude (perceived usefulness, ease of use and compatibility) and perceived behaviour control (self-efficacy and resource facilitating condition and technology facilitating condition) positively influenced lecturers to use various Web 2.0 technologies, no clear evidence was noted to prove that lecturers are encouraged by their colleagues, seniors or students. On the other hand, Internet access remains the recurrent key stumbling blocks towards a successful adoption of Web 2.0 technologies by lecturers. The study has established that though Internet connectivity is good when available, access is restricted to offices for lecturers as there is no Wi-Fi across the campus.

Therefore, the study recommends that the newly established Department of ICT Directorate with support from MZUNI management should kick start its duties by making sure that the university campus has robust and reliable Internet connectivity including the installation of a campus-wide Wi-Fi so that lecturers can access Internet technologies such as Web 2.0 using their smartphones and laptops anywhere on the campus premises especially in teaching venues where they can use it for teaching.

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